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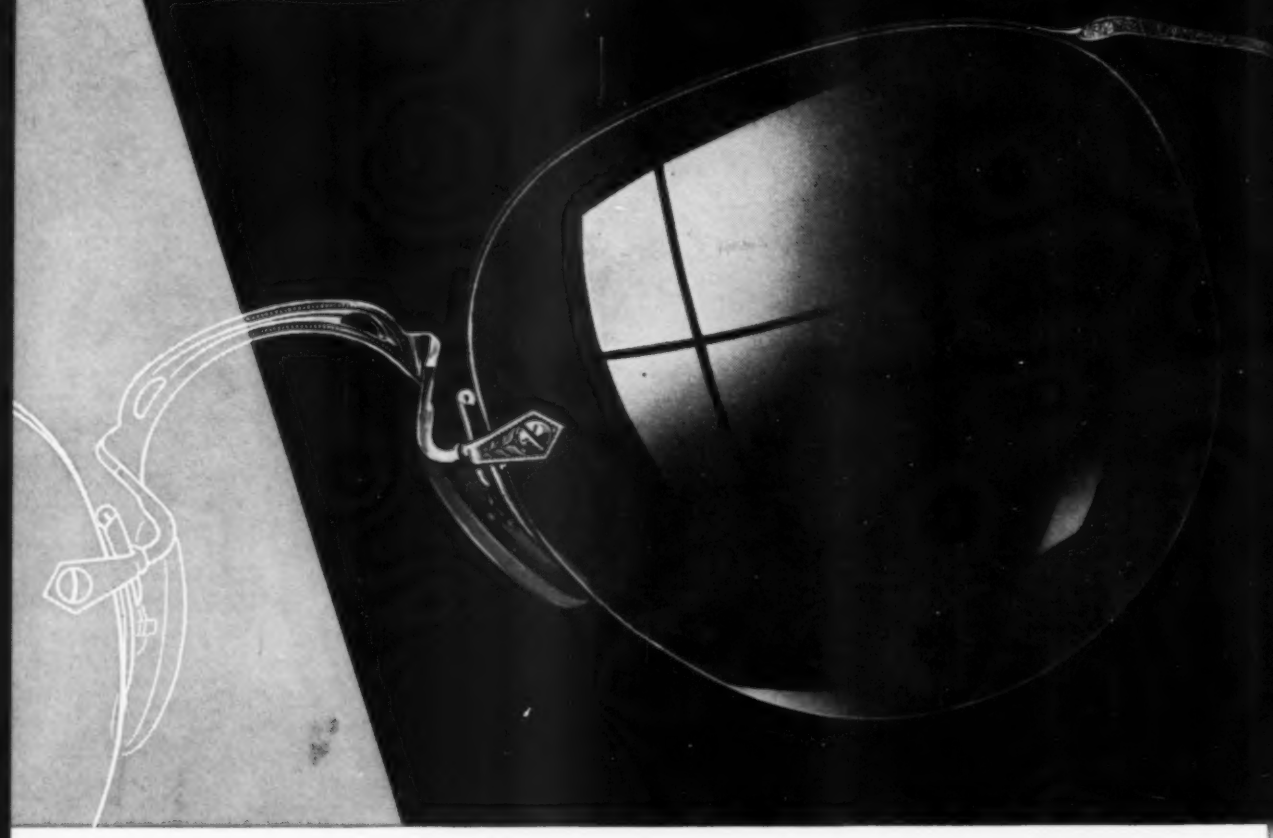

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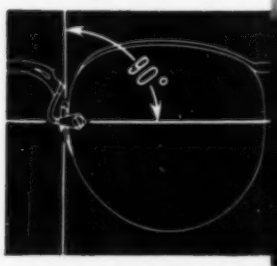

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. . . maintained by pressu
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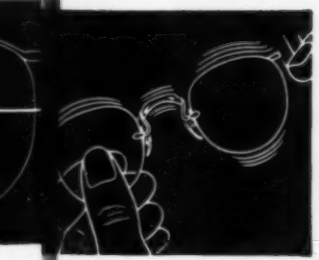

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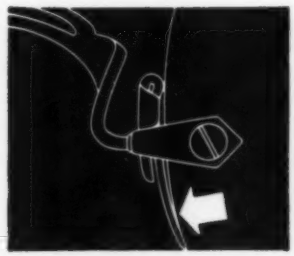
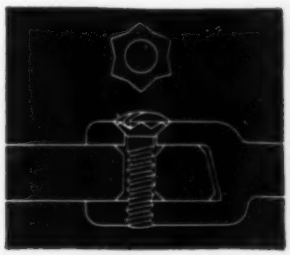
Simplified assembly . . . no shaping of shoe . . . no lens block . . . no hole filing . . . no need for lens strain test.



Lifetime spring . . . gold-filled for appearance and corrosion resistance, always quickly returns to shape.



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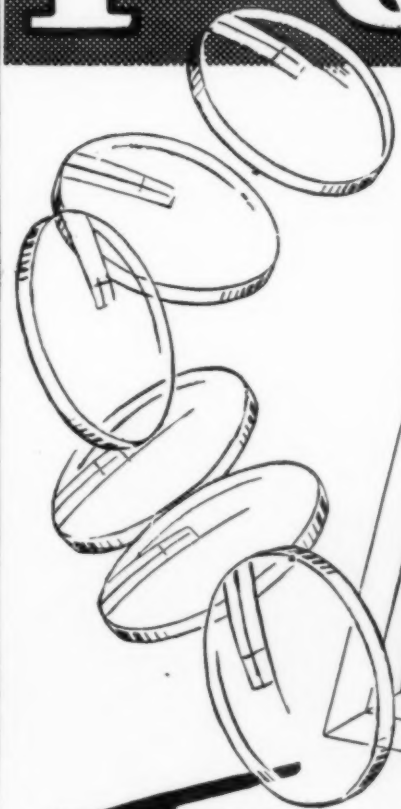

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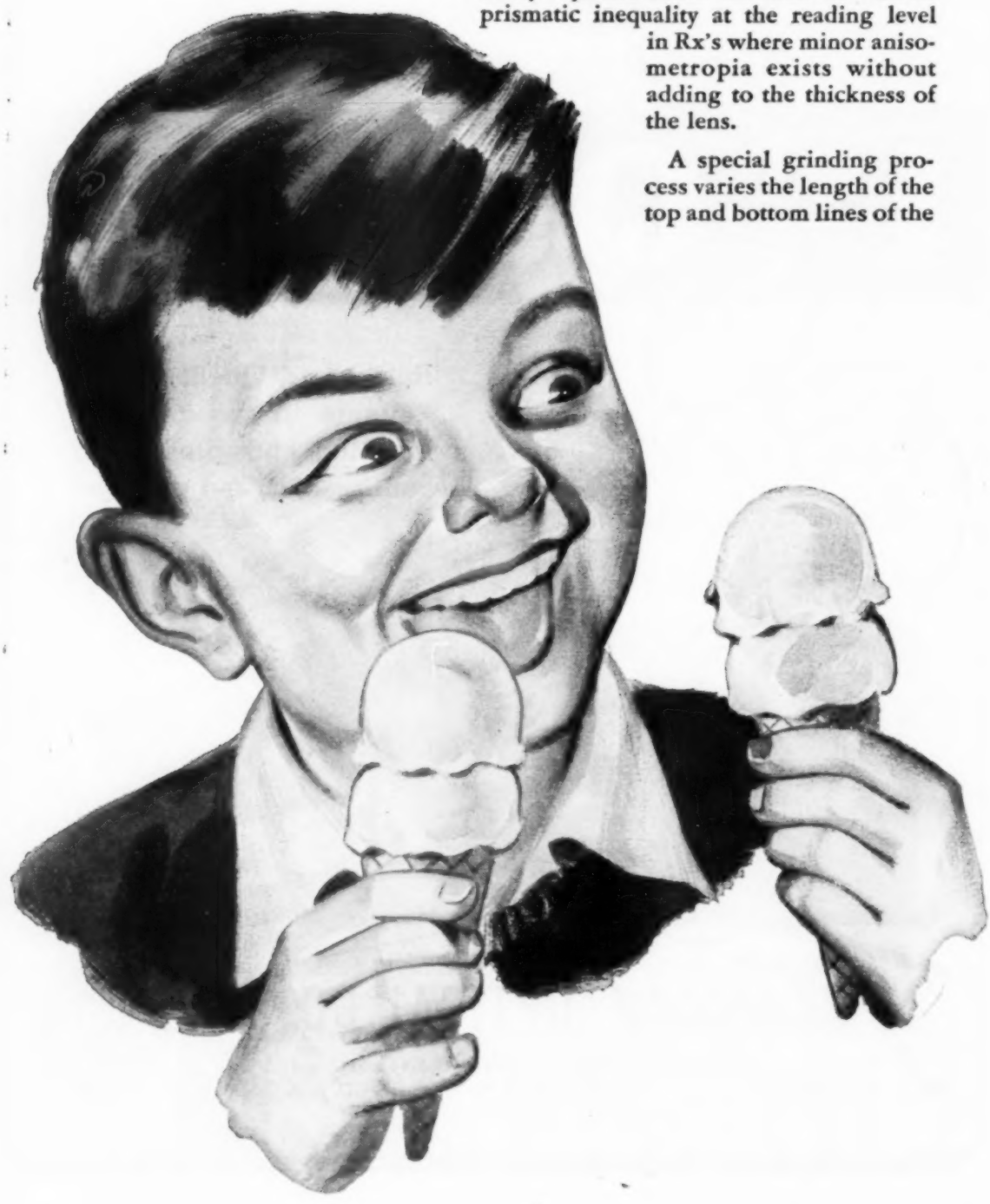

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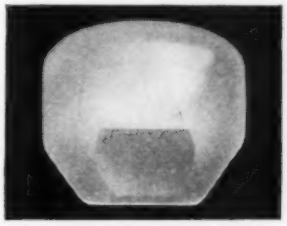

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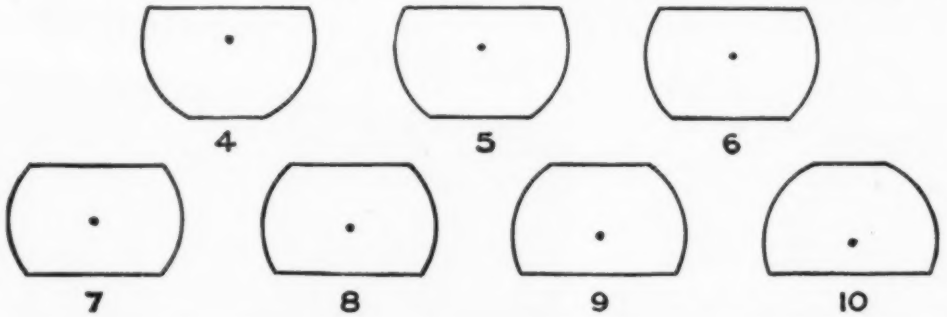

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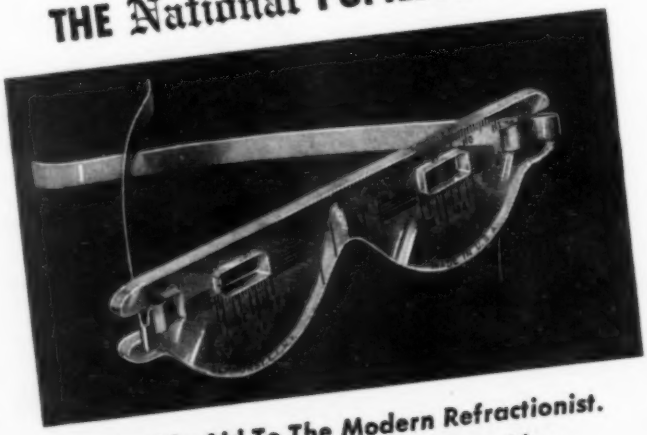

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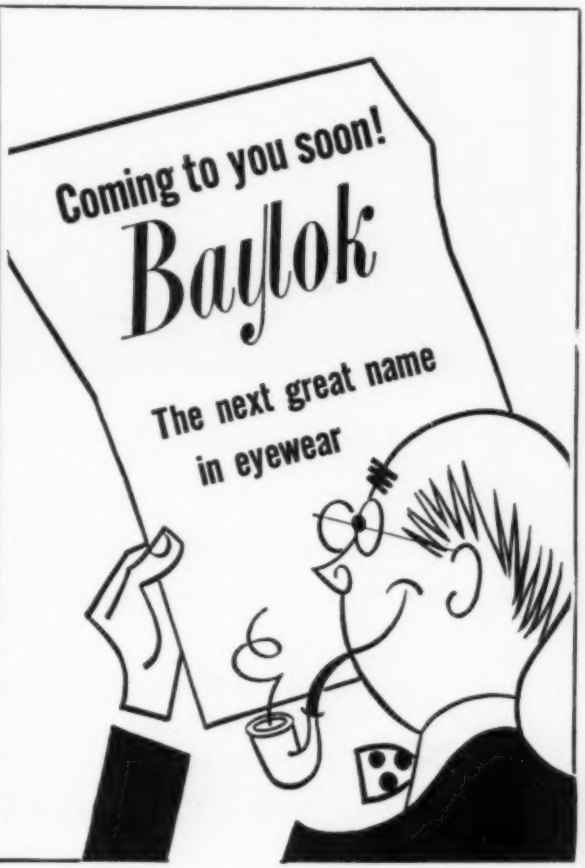

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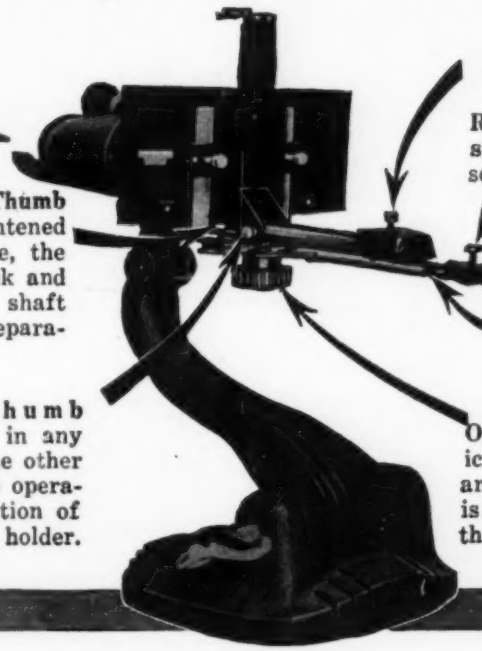

Telebinocular Shaft Thumb Screw, that holds the ortho-split-slide holder.

Rear runner is held at any desired setting by this thumb screw. The setting for orthophoric movement of the stereographs is identified by the

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Ask a Riggs representative about the Royal "50".

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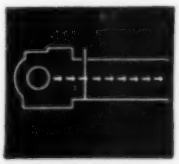
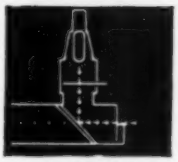


Lights *behind* targets—vital in providing clear definition with light evenly diffused. Control of this light is independent for each eye—a helpful feature in training.



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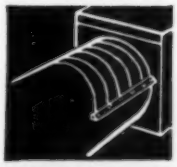
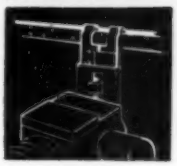


Target slots calibrated in quarter diopters, making possible *instant changes in the stimulus to accommodation.* Changing targets from infinity slot to one of the other positions is equivalent to adding plus or minus lenses.



Base in and base out scales provide quick, easily-read, *accurate measurements* for infinity and at near. Base up and base down readings easily taken as target tubes are lowered and raised. Break and recovery points can be quickly determined.

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Vol. 24 AUGUST, 1947 No. 8

TRIFOCALS—THEIR THEORY AND APPLICATION*

Roy Marks†
Dayton, Ohio

This is not a paper written to bring out the fundamentals of a lens device. Rather, it is a compilation of data gathered, over a period of years, by observation and clinical research.

During the past few years there has been a remarkable increase in the use of trifocal lenses. This may be due to one or all of the following factors:

1. Decided improvement in the design and manufacture of trifocals.
2. Better understanding of where to prescribe and how to fit.
3. More thorough analysis on the part of the practitioner as to the needs of the patient insofar as the near seeing task is concerned.
4. Increase in amount of clinical data available for study and subsequent increase in confidence on the part of the practitioner when this data became available.

In order that we may benefit from this paper, let us evolve the various reasons outlined above and come to a more thorough understanding of the reason for the present day success of trifocal lenses.

Before examining the evidence in support of the trifocal, let us glance at Figure 1. This chart illustrates graphically the various stages of trifocal progress and is offered in evidence that the trifocal is no longer a gadget but actually is a lens device well on its way to common acceptance.

Statistics clearly show that any new idea has, after its inception, a period of slow and doubtful progress. The kernel of the nut is taking

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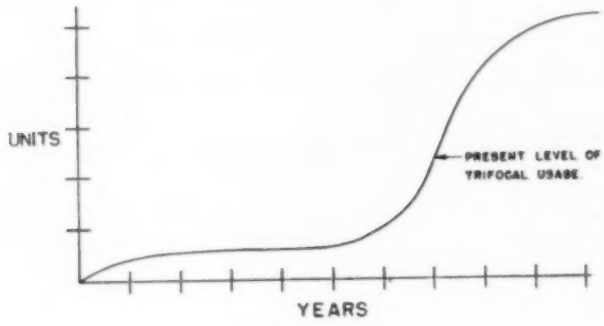

Figure 1

root. This period is usually short lived, as illustrated. Then sets in a relatively long period of slow and barely noticeable progress. Usually in the case of ophthalmic products, and especially in the case of lens devices, the product is used mostly only by those who were in at the beginning; but, after this period is over, a sharp upswing is noticeable. From there on the progress of the article is tremendously accelerated until a peak, usually the saturation point, has been reached. Then there is a leveling off, as illustrated. The product has "arrived," so to speak, and from that point on enjoys a normal usage.

Statistics gathered from reliable manufacturing sources indicate that the trifocal is now in its ascendency; that is, it is enjoying the rapid acceleration of the acceptance curve and is at the point indicated on the graph. Let us return to examine the facts responsible for this.

DECIDED IMPROVEMENT IN THE DESIGN AND MANUFACTURE OF TRIFOCALS.

It is believed that the first commercially practical trifocal was made available about 1910, and was the result of the efforts of one Charles W. Connor of Indianapolis, Indiana. Others, prior to that date, had prescribed and fitted cemented trifocals of various shapes and sizes but these were specially made and difficult to produce. After the advent of the Connor type trifocal, which had a fixed intermediate power regardless of reading add, other trifocals appeared and enjoyed a fair measure of popularity—but their deficiencies were many. All had the completely round segment top and no control over the position of the optical centers of the segment that is so characteristic of the old style of bifocal. All had more or less fixed intermediate powers which did not provide a truly scientific approach to the problem of "arms' length vision."

In the very late twenties and the early thirties a thorough study of

these deficiencies was made, leading to our present day scientifically designed and thoroughly practical trifocal lens. American Optical Company, Bausch & Lomb Optical Company, Continental Optical Company, Shuron Optical Company and the Univis Lens Company all manufacture highly successful trifocal lenses which can be fitted with greater wearing comfort and provide a more practical answer to the presbyope's needs. Let us examine the improvement in theory and design of these lenses.

One of the most significant advances that has been made is the variation of intermediate power. It is not practical to assume that a fixed intermediate power is adequate for all presbyopes any more than one can assume that a fixed reading power is adequate. Today all improved type trifocals are made with variable powers according to the reading add. They are as follows:

Table I

UNIVIS	—	50% of the reading power
SHURON WIDESITE	—	54% of the reading power
PANOPTIK	—	62% of the reading power
FULVUE	—	66% of the reading power

This means that with a 2.50 added for reading the following would be true:

Table II

Type	*Intermediate Power*
UNIVIS	+1.25
WIDESITE	+1.37
PANOPTIK	+1.55
FULVUE	+1.66

It is not within the scope of this paper to decide which of the above is best. Rather, it is significant to note a healthy difference of opinion, which is not too widely diverged. Of greatest interest is the fact that all subscribe to a *variable* intermediate add.

Now as to shape and size. As has been pointed out, the old style shapes were not totally acceptable. This fits with the present day thinking that modern shape bifocals are easier to use and logically sets up a reasonable premise that old style trifocals were not successful partly because of their shape.

The reading portions of the trifocals are basically the same as those provided in standard modern bifocals and their success is well known and accepted by all.

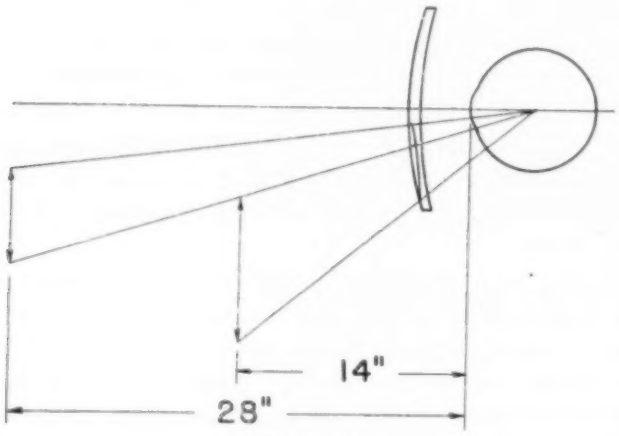

Figure 2

The intermediate seg sizes have been carefully worked out to provide maximum field at arms' length. Criticism has been offered that these sections are too small. It is well to illustrate, at this point, that a 6 mm. vertical intermediate field is adequate for general purposes. Figure 2 illustrates that an intermediate field of this size gives approximately the same vertical field at 28 inches that a standard segment gives at 16 inches. because of the visual angle subtended.

It is to be admitted that for special vocational use a larger intermediate may be necessary, but it is well to bear in mind that a sacrifice in reading field must be expected. It is possible to obtain larger intermediate fields, and at least one manufacturer is supplying a trifocal with an 8 mm. vertical field for vocational use, whereas their standard 6 mm. is still the most popular for general purposes. Other shapes are available on special order but these are tailor-made and do not represent standard types.

It is encouraging to note that so important do manufacturers consider trifocals that some offer a highly specialized service involving the design of special combinations of powers, special placement of segments, etc., all to encourage the scientific application of a three foci lens device.

BETTER UNDERSTANDING OF THE TECHNIQUE OF WHERE TO PRESCRIBE AND HOW TO FIT.

Of equal importance to the growing use of trifocals is the fact that we find, through education and experience, refractionists now know much more about fitting technique and also the type of patient suited to trifocal wear.

In regard to fitting, probably no single item has been more controversial. To discuss fitting errors is not within the province of this paper. Rather, it is most important to present the results of clinical research and data from a positive point of view, and describe a successful fitting technique.

One concept must first be brought out because, unless it is accepted, proper trifocal fitting becomes impossible. We must remember that even though a third field is prescribed, the major use of the lens device, in most cases, is still for *reading* at normal reading distances. In other words, we must remember that the trifocal is used mostly by the patient as a *bifocal* and, consequently, emphasis must be placed on proper reading seg placement. The modern trifocal, because of its advanced design, permits this; and it has been found that trifocal fitting is only successful when the top of the reading seg is placed at the same position in relation to the lower lid as in a regular modern bifocal, bearing in mind that modern bifocals can be fitted lower than round-top types. The top of a six or seven millimeter intermediate will then appear at the lower margin of the pupil. In a normal position, the head is inclined forward and downward about 10 degrees, permitting ample vision at distance. Inasmuch as all objects to be seen through the intermediate field are below the distance line of vision, and above the reading line of vision, the intermediate is in a perfect position for use.

Any serious deviation, such as lowering the intermediate to the normal height of a bifocal will void all gains and make the lens unwearable for practical purposes. Occasionally, occupational problems demand a variation from this, but only very seldom. The manufacturers and lens designers have considered trifocals of such major importance so as to have made available a relatively large number of trifocal designs. Each one has its special or general application, and there is no need to vary from this fitting technique if the proper selection is made by the refractionist.

To repeat, the primary function of the trifocal is still reading vision. The *segment* must be fitted with that in mind. The top of the reading section should be placed at the same height in the lens as it would be in the case of any modern bifocal. It is recommended that advantage be taken of the value of the straight-top and raised optical center of the modern segment, and that it be fitted one millimeter lower than round-top types.

"Where to prescribe" has also been a moot question. Let us examine the amplitude factor of a presbyope. A patient requiring a +2.00

add for reading has 1 D. of amplitude. Half of this he can comfortably use for reading. He, therefore, cannot comfortably see objects through his bifocal at a distance greater than 50 cms. His 1 D. of amplitude will not permit him to see objects though his distance correction at a point closer than 1 meter. All objects between 50 cms. and 1 meter are, therefore, blurred and not easily seen. Using a +2.00 add trifocal with an intermediate field of 50%, or 1 D., will provide him with ample vision to overcome this deficiency. The lowest add where this amplitude factor plays an important part is +1.50 add. At that point, however, the patient is borderline, and his need for aid is questionable. Certainly a +1.75 add patient would be helped considerably. He has an amplitude of 1.50 D. and, therefore, has a near point of 75 cms. Inasmuch as his bifocal add gives him vision out to 50 cms., he will have 25 cms. of blurred area. Table III illustrates the distribution of trifocal adds percentagewise. This information was obtained from the production control department of the largest manufacturer of modern trifocals. It can be seen that, although some trifocals are fitted below +1.75 add, their real use does not begin until that point, and then the volume increases sharply.

TABLE III

Add	Distribution
0.75	1.8%
1.00	3.5%
1.25	4.4%
1.50	13.6%
1.75	14.6%
2.00	18.2%
2.25	20.3%
2.50	20.9%
2.75	3.0%
3.00	2.1%

Chart showing the distribution percentagewise of trifocal usage

It appears obvious from the foregoing point that it cannot be said any longer that trifocals are an occupational lens device and, as such, should only be prescribed for specified vocations. Any person wearing a +1.75 add or more must have a blurred area of 25 cms. minimum; and if he is to be given maximum eye range over all of the distances he is required to see, a third field is mandatory. Trifocals should replace bifocals on adds of +1.75 and over, as bifocals simply cannot do the job. It was surprising to find the number of men with that philosophy, and to observe the clinical results and outstanding success of this practice. Modern design and proper fitting have made trifocals easier to get along *"with"* than *"without,"* and today have taken their place along

side of many new devices to make the practitioner's job more simple and successful.

MORE THOROUGH ANALYSIS ON THE PART OF THE PRACTITIONER.

In light of the previous statements concerning the need for a trifocal from a technical point of view, i.e., taking the amplitude factor into consideration, it appears that trifocals should replace bifocals on all adds of +1.75 and over.

In the past very little consideration has been given to the binocular coordination of the eyes when multifocal lenses were employed. This was done because the corrected presbyopes usually did not have binocular difficulties provided the power of the near point add was not too high. A complete explanation of this finding cannot be given at the present time. It is known that the explanation will necessitate a thorough knowledge of the different types of convergent movements of the eyes, as well as the distances of all near objects from the eyes which are voluntarily chosen by individuals with presbyopia. It is even possible that the distance between any near object and the eye is always made equal to the distance between the near point of clear vision with or without the add and the eye. By such a procedure, any problem of binocular coordination would be avoided, since the eyes could be voluntarily converged without a change of accommodation.*

It would be a serious error to draw any conclusions regarding the power of multifocal lenses which should be prescribed for any given case of presbyopia from the evidence which has been presented in this paper. Such conclusion can only be reached after a careful and thorough evaluation of all available and necessary experimental findings on the essential nature of the physiological functions involved. Likewise in each individual case, the needs of the person who is to use the lens has to be taken into consideration.

It should be understood that as long as only bifocals were available, the empirical procedure, by which one-half the amplitude was kept in reserve, proved satisfactory. However, the advent of trifocals necessitates the clarification and introduction of concepts in regard to the basic

*It is easy to demonstrate the change of accommodation with convergence by fixation of a near object, such as a finger held several inches from the nose. When this is done all objects in the visual field with the exception of the one fixated is out of focus and thus blurred. An absolute presbyope (that is one without any amplitude of accommodation) can fixate any near object, regardless of the amount of convergence required, without the clarity of the objects in the visual field being affected.

physiological functions affected by the prescription of near as well as intermediate adds.

The possibility exists that there is actually an essential difference between the prescription of a bifocal and a trifocal. For example, if it can be proven experimentally that a presbyope can voluntarily converge without accommodation at the near point of clear vision, the power of the near add in a trifocal will be different from that in a bifocal. With a trifocal, the near point of clear vision through the intermediate add would then provide a secondary position at which near comfortable vision could be secured. Hence, the notion of the use of a multifocal lens would be somewhat enlarged.

It should now be apparent that no final decision concerning the power of the intermediate add can be reached until the role of the convergence factor in the near add of a trifocal prescription is experimentally answered. An investigation of this problem has been undertaken by the consultant in physiological optics to The Univis Lens Company.

It would be unfair not to include some words of precaution in this paper. Some patients are psychologically unsuited to trifocal lenses. A neurotic patient with an inherent fear of *any* multifocal may well be shied away from unless the practitioner can convince him or her that "trifocals are easier to get along with than without." Certain occupational cases demand special treatment. It is well to determine the effective work range, and establish whether the intermediate powers illustrated in Table I will provide the proper range. If not, a special combination should be prescribed.

Special designs are sometimes in order. Occasionally, a seg at the top instead of immediately above the reading section will give better results.

In general, data indicate that the successful practitioner has assumed the role of lens designer in many cases where he feels the standard types of trifocals are not adequate. Thorough analysis of the patient's near seeing task has become a standard practice with many, and best results are obtained.

Minus adds are not uncommon. Where the need is great, for a large intermediate field to provide for a special vocational task, the lens is made of special glass so that the main body of the lens can be ground to the intermediate power, a regular reading seg below and a minus or "subtraction" add fused or ground at the top to provide a distance window.

Many practitioners are not unaware that aphakic cases, more than any other, require an intermediate field. Where accommodation is nil, this need is emphasized and much patient satisfaction can be provided by fitting a cataract trifocal instead of a cataract bifocal.

To restate, trifocal use has also increased because practitioners are more thoroughly analyzing their patients' near seeing task.

TRIFOCALS ARE INCREASING IN USE BECAUSE MORE DATA ARE AVAILABLE

In the past few years, many instructive and well written articles have been written on the subject. Marshutz, of Los Angeles, is an excellent example, in the OPTICAL WORLD, March, 1946, issue. Others have similarly been free with valuable information and clinical data. Ernest Hutchinson of the Los Angeles School of Optometry has long been a staunch supporter of the trifocal school, and has provided much valuable data on the subject.

Many practitioners, now trifocal enthusiasts, have kept accurate case records, outlined fitting suggestions, and have available excellent progress reports. The practitioners themselves have done much to improve design and these data are becoming more accessible.

As in any other new idea, this information is valuable; and in this paper an attempt has been made to present, in a general way, the consensus of many of these men. It is encouraging to note that the ophthalmic profession is eager to accept new devices in an attempt to improve its own skill and the comfort of its patients.

THE USE OF BIFOCALS IN MYOPIA—A CASE REPORT*

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PATIENT: B. D., Male, Age 18.

OCCUPATION: Engineering student.

CHIEF COMPLAINT: Poor visual acuity at distance. Tiring of the eyes—no headaches. Eyes itch and burn after reading.

HISTORY: Lenses worn past two years, during which time they have been made stronger three times. No history of any disease or eye injury. Neither parent wears glasses constantly. Father has prescription for reading.

GENERAL HEALTH: Good. Last physical examination one year ago—college entrance. No major operations. T. and A. five years ago. Dental X-ray three months ago—negative.

VISUAL HABITS: Two to three hours study daily outside of school. Drafting lab 10 hours weekly. Outside reading in spare time. Study lighting conditions—poor.

Preliminary examination reveals:

Unaided visual acuity: O. D. 20/300. O. S. 20/300. O. U. 20/200.

Versions and rotations: Normal.

Amplitude of triangulation: 2 inches.

External examination: Lid margins normal; slight conjunctival injection; cornea clear; iris margins well defined; pupillary reflexes direct and consensual, rapid; no corneal opacities.

Ophthalmoscopic examination: Media clear; discs well defined but with slight temporal myopic crescents; vessel distribution normal; venous relationship 2 to 1; fundus pale.

Transillumination: Frontal and maxillary sinuses clear; teeth normal; gums in good condition; throat good; tonsilectomy five years ago.

Analytical examination:

Ophthalmometer: Not used routinely. It is used, however, in cases where

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†Optometrist, Fellow, American Academy of Optometry.

a large discrepancy exists between the cylinder findings of the retinoscope and the subjective.

	O. D.	—3.25 —.50 x 180
Retinoscopy (static):	O. S.	—3.25 —.25 x 45
	O. D.	—3.00 —.50 x 180
Subjective:	O. S.	—3.25 —.50 x 45
	O. D.	20/20
Visual acuity (corrected):	O. S.	20/20
	O. U.	20/20+3

Muscle balance and near point findings:

Induced phoria:	1° Exophoria
True adduction (blur out):	15 D
Convergence:	30/18
Abduction:	6/3
Vertical phoria:	0
Near point phoria:	4° Exophoria
Unfused cross-cylinder:	O. D. —2.25 —.50 x 180
	O. S. —2.25 —.50 x 45
Fused cross-cylinder:	O. D. —1.50 —.50 x 180
	O. S. —1.75 —.50 x 45
Phoria through fused X-cyl:	7° Exophoria
Fusion and stereopsis:	Good. (Lange).

The following findings were taken through a +1.25 D. add, as trouble was encountered by the patient in trying to see near point type (reduced Snellen, 20/20 line) through the subjective.

Tolerance adductive stimulation:	16D
Positive fusional reserve:	26/18
Tolerance adductive inhibition:	13 D
Negative fusional reserve:	20/14
Amplitude of accommodation:	6 D
Tolerance of accommodative stimulation:	—3.50
Tolerance of accommodative inhibition:	+ 2.25

This case reveals the often encountered increase in myopia common among students. Although there is no history of myopia in the family, it is safe to assume that there has been an increase in this myopia. History reveals symptoms of eyestrain, e.g., tiring and headaches with previous correction.

Observation reveals nothing of unusual importance except that slight injection of the vessels not usually associated with myopic

patients who have satisfactorily adjusted to minus lens correction.

Ophthalmoscopic examination reveals only the myopic crescent often encountered in a myopia of this degree.

Subjective and static retinoscopy agree closely, therefore it may be assumed that the distance correction will satisfactorily solve the distance seeing problem. Abduction is lower than expected. This is often true in myopic patients whose near point problem has carried over into the distance, and affected the normal muscle balance.

The fused cross-cylinder findings reveal a near point problem, and indicate that additional plus will probably be required. This is borne out by the fact that the patient has an amplitude considerably below normal for his age, and although 18 years of age, has trouble in reading the reduced Snellen chart.

Plus 1.25 was selected for the near point findings as it approximated the add revealed in the fused cross-cylinder, and produces good balance between the positive and negative fusional reserves. The physiological exophoria is increased to near normal by this addition and acts to cushion accommodation and convergence. The blurs encountered in adductive stimulation and inhibition are balanced and near normal.

The tolerance of accommodative stimulation and inhibition are brought into a much better relationship by the addition of the +1.25 add.

The final prescription is as follows:

O. D. —3.00 D. sph ⌒ —0.50 D. cyl. x 180
O. S. —3.25 D. shp ⌒ —0.50 D. cyl. x 45
Add. O. U. +1.25 D.sph.

The patient was advised to procure bifocals, and was instructed in their use. He was further instructed as follows:

1. To obtain a reading lamp to be used at all time for studying, reading or any close work. Care in general lighting.
2. Never to work closer than 13 inches and preferably at 16 inches.
3. Not to work too long at a time without resting the eyes—preferably in half-hour periods. During the school year to undertake only that reading which is necessary for school.
4. Proper diet, sufficient sleep and regular exercise.
5. To obtain outdoor work if possible during the summer months.

SUMMARY: The fact that this case was not as myopic at near point as at far point, was first indicated in the cross-cylinder findings. The add

was determined by the cross-cylinder findings and the accommodative stimulation and inhibition tests. That this add could be worn was further substantiated by the balance gained in the positive and negative fusional reserves. It would, of course, be possible to undercorrect this patient at distance to allow him better adjustment for close work. This, however, is a compromise procedure and would not be correct for either distance or near.

Every attempt was made to correct faulty visual habits so that future progression of the myopia would be reduced as much as possible.

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THE BASIS OF VISUAL FATIGUE*

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The literature on visual fatigue includes many diverse phenomena. In fact, examples of fatigue are as diverse as visual phenomena themselves, for it appears that visual fatigue is the name given to any diminution in intensity or slowing down in rate of a visual process, or any other change thought to be deterioration and which is not otherwise labelled.

Visual fatigue studies are divided into five classes: (1) the sensory, (2) the ergographic, (3) the symptomatic, (4) the ease-of-seeing, and (5) conflict.

Sensory studies are divisible into several kinds: studies of changing thresholds, studies of changing adaptation, studies of objects of perception which disappear with steady fixation, and studies of changing critical flicker frequency.

Ergographic techniques long common in skeletal muscle investigation have been applied to the study of accommodation and convergence. The application to vision consists in varying target distance alternately from near to far. This provides for concomitant changes in muscle posture, and after repetition of these alternations in target distance the behavior may shift in character. The near point may, for example, recede and diplopia may occur under progressively lesser demands for convergence. Such changes are either taken to be fatigue itself, or are attributed to fatigue, depending upon the kind of thinking that is used in the particular situation. In certain studies of this kind, the origin of the changes has been traced into the central nervous system, hence fatigue is attributed to the central nervous system and not to the muscles involved.

The third group of fatigue studies is the symptomatic. In them, the criterion for fatigue is the patient's complaint either of fatigue itself or of some kind of discomfort from the use of the eyes. Occasionally, reduction in some visual skill is taken to be a basis for inclusion of the

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†Professor of Psychology.

patient in the group to be studied. An attempt is made to find some connection between the patient's complaints and measurable features of oculomotor test performance. The ophthalmograph, for example, is used to determine anamolies in eye-movements in prescribed reading tasks. Up to now, studies of this sort have not proved too fruitful in making the expected correlations between symptoms and oculomotor behavior.

The fourth type of fatigue study is a group of investigations dealing with ease-of-seeing. These constitute a systematic attempt to associate quantitative features of visual function with the conditions under which seeing occurs. Such investigations are concerned mainly with two variables: level of illumination, and the nature of reading material. High levels of illumination are compared with lower levels, and various sizes and styles of type are compared with each other. Instead of asking the individual how he feels after various periods of reading, or whether he is tired, certain so-called objective measures are used. Amount of reading material comprehended, rate of reading, number of blinks per unit period, pupil diameter, etc., are taken to be the most appropriate indicators yet found. This means that either work output or some incidental physiological indicator is used instead of the subject's own report on the way he feels, or what his attitude toward the task is. In such studies, fatigue as a kind of experience is generally ignored altogether. This is probably because it has been found that subjective feelings and work output tally very badly. Incidentally, I might say that, on this basis certain objective measures might well be discarded also.

The fifth, and the more recently employed, type of fatigue study is the analysis of conflicts in visual performance. This method rests upon the assumption that discomfort arises from the malfunctioning of visual mechanisms such as certain reflexes. This method also recognizes the fact that disorganization may occur in the individual and that it may occur within visual mechanisms themselves. It presumes that discomfort and the frustration involved in various visual situations lead to fatigue.

Whereas all visual mechanisms are not equally accessible, it is possible to show that internal conflict does occur in oculomotor behavior, for instance, in such reflexes as the pupillary light reflex. The technique consists in putting these mechanisms under unusual demands and in determining the ways in which they get into trouble. In such situations there are several kinds of items to deal with, including disorganization, the thwarts and frustration of accomplishment it produces, and the resulting fatigue.

It can be seen from the foregoing that conventional studies do not view fatigue as a single phenomenon. There is no single characteristic common to the many phenomena mentioned in the classification. In some it is a slowing down in the rate of performance; in others it is a reduction in contraction amplitude of muscle; in still others it is a qualitative change in some object of perception. If there is any one thing to be taken as common to all the various manifestations which are put into the fatigue category, it must be some cellular process or type of processes. In principle, fatigue has been made the departure of some process or experience from some standard which was met when activity began.

Many good studies have been made in the classifications just outlined, but they have told us little directly about fatigue. At least it can be said that they have fallen short of answering man's original and still persistent question: namely, what makes people tired? To answer this question, we must immediately include the question, what is fatigue? The common man thinks he has the answer to that, for he feels fatigue. He can identify it. He knows when he is tired and when he is not. He never asks anyone else to determine that for him, not even an expert.

We must answer the question of whether fatigue is something which applies to body parts and, perhaps as mechanical engineers would have it, to inanimate objects or structures as well, or whether fatigue is uniquely something that applies alone to human beings as experiencing organisms. The term was originally coined to pertain to man as a whole. If anything else was considered to be tired, it was only by the individual's anthropomorphizing—that is, by reading human traits into other objects. Undoubtedly this was done frequently by early man, and has been done upon many occasions since his time. Let us say, however, that we are interested alone in what happens to man as an experiencing organism. This means that we face the problem of excluding the idea that one's eyes or one's arms, or any other bodily part gets tired. This is not to preclude doing something about the fact that one's bodily members do not always function equally well, and that they hurt or feel uncomfortable, or at times seem inadequate.

There are two reasons why a bodily member cannot function well: either something is wrong with it locally, or the innervation from the central nervous system is lacking or changed in character. Now, we do know, for instance, that muscles may fail to act for one of several reasons. The trouble may be local, or it may be innervational. Are we going to call the local trouble fatigue, or are we going to retain the term

for the central condition which modifies or precludes the muscle's further activity? Conventional thinking has long had its own answers for these questions. It, however, lumps all of the difficulties under the single term fatigue. This practice is part of the failure to accept the idea that in fatigue we must be dealing with something that pertains to the person as a person.

It is my purpose to outline a view which is quite different than the view which, in one form or another, is held throughout the literature on the subject.

It would seem fruitful, in light of what we know regarding human behavior, to retain fatigue, or some other term, for labelling what happens to the individual as a whole; something that can be identified experientially.

In so doing, we shall be asking the original and universal question of what makes one tired. I believe that adherence to such a position is workable, and will try to show the logic of it, and how it is usable in research and practice. Keep in mind, then, that it was only after man began to inquire into fatigue that it became so many different things, the character of which, in many cases, was determined more especially by the more convenient experimental tools at hand than by the original questions. Keep in mind, further, that when this sort of thing prevails, the questions stray from the point, and whatever be the answers, they are irrelevant regardless of the carefulness of the work. Too often, other individuals inspecting such work accept it and the results, forgetting the demands of the original inquirers. Consequently, more and more research of the same kind is perpetuated. It is good and solid research, but irrelevant. Fatigue becomes simply what is studied in the experiment, and not what it was originally conceived to be. It becomes more and more narrowly restricted, as the investigator narrows down his conditions of inquiry.

Fatigue has generally been held as an energistic concept. People get tired from doing work, or from some kind of activity. Muscles get tired from contracting. Nerves get tired from conducting impulses. Steel beams get tired from supporting loads. Thus we can see that concepts of work and energy have become bound up with the fatigue concept in many intertwining ways. We must examine these interrelations and attempt to clarify the picture. To anticipate the story a little, I shall say that we shall have to abandon the energistic notion regarding the origin of fatigue. Everyone knows that people may feel tired without having done work which would have accounted for it, and fail to feel

tired after they have worked much more than enough to have produced fatigue.

At present it is most common to witness an implied fixed relation between feelings of effort, weakness, lassitude, etc., and the expenditure of, or lack of, a fixed amount of energy. There is confusion between what to think regarding the experiential series of events and the physical series. We characteristically interchange the items in the two series and breed confusion.

Let us therefore inspect the situation and see if we can become aware of our inadvertent errors. The concepts of *energy* and *work* originally labelled something about man's experiences or his activity. They did not originate in the physics laboratory, as we generally seem to think.

To feel energetic meant to feel like being active. Force, for example, was the mechanical action, either of the individual or some outside mechanical body, which elicited in the individual the feeling of effort. Work was the application of force; hence was the activity of the individual which resulted in the feeling of effort. The feeling of effort was used to gauge the amounts of push, pull, lift, etc., applied by the individual. The sensory or experimental tinge was present in every mechanical situation. While it was not necessary to impute the experiential to the inanimate objects around him, man saw other objects act against him, and used the same terms to describe the mechanics involved.

Physics took over the terms energy, force, and work, and in so doing was initially a bit anthropomorphic. However, it finally gave these terms strict definitions of its own. Operational definitions, as we now call them. For example, work became the name for the displacement of mass in space, the name for pounds displaced so many feet, or grams so many centimeters. Thus we now have the precise units of work, called foot-pounds, and gram-centimeters. The concept of energy in the physical sciences has some very sophisticated mathematical connotations, and the term energy is not properly used in all the ways employed today.

When we now use the term energy in describing human behavior, especially when we are talking about the experiential, we are inadvertently intermingling the original connotations with those now used in the physical sciences. In so doing, we are erroneously identifying the feelings of effort and strain, lassitude, and other kinds of discomfort with something that is not at all precisely related to them. None of these feelings have a coefficient of conversion. There is no simple *experi-*

ential equivalent of energy, as there is a mechanical equivalent of heat, etc., in the field of physics. Nevertheless, when we are listless or lazy, we imagine with all good conscience that the trouble is the lack of energy in the sense that the physicist defines energy. We are sure about it for we actually experience something which we have been taught to think of in no other way than as energy-lack.

The denial of the appropriateness of deducing energistic resources by subjective criteria does in no way deny that energy is involved in human activity, or that energistic limits may be reached. It simply requires that to measure energy we must stay within the discipline in which means for energy measurements are provided. Physical concepts and techniques, and these alone, are capable of doing what is asked in this case. We shall see, a little later on in what I have to say, how this relates to the matter of dealing with fatigue.

I have already pointed out two necessary things to recognize regarding the fatigue problem; namely, (1) that fatigue is to be the name for something that happens to the individual as a whole—that it is experientially determined, and (2) that fatigue is not being used as an energistic concept—that attempts to relate it strictly with either energy state or the amount of work done have not been successful.

We are ready to see what has grown out of the failure to recognize those two points. It is simply this: that since feelings of fatigue, concomitant physiological processes, and work output, could not be made to tally in a one-to-one relation, a possible single concept of fatigue, whatever it might have come to be, was precluded. The term fatigue came to be used for three quite separate kinds of phenomena. Workers took their choice as to whether to deal with one or the other of the three. Some chose to study fatigue as a decrement in work output. Industry chose this path and defined fatigue as whatever reduced work output. Consequently, most every industrial study has sidetracked the question as to what goes on in the organism that is doing the work. It should be clear, however, that if fatigue is to mean anything, it must apply to the acting system and not primarily to the work products.

Some investigators chose to deal with physiological processes or changes in them that, according to their lights, could be called fatigue. These were such processes as had not already been given a name, or that were not yet well understood. Fatigue became quite decidedly a wastebasket into which any phenomenon that was little understood could be put. Curiously enough it was at the same time considered an explanation for a phenomenon to be put into this category, a category that had not itself yet been given a precise definition, or delineation.

Other investigators chose to see what they could do with the subjective aspect of the problem. Since they could make little headway in terms that they could call objective, they failed to make full use of sensory criteria. Little came from this line of work, and, in many circles, it fell into disrepute.

During all of this time, the frank original questions have remained as pertinent and as pressing as ever. All of the sophisticated restrictions characterizing the conceptions in the various avenues of present-day fatigue research have not successfully converted fatigue into being the many diverse objects of laboratory interest. The questions regarding fatigue retain their original character.

We come now to the beginning of a way out. We must first discuss the solution in general terms before specifically dealing with visual fatigue.

We must ask what can happen to any functional system. We must determine into what categories changes in function can be placed, how many such categories there are, and what their characteristics are. Just what can happen to a system, regardless of whether it is a biological one or an inanimate physical one. There are two fundamental factors which go to make up any system—parts, and the functional relations between these parts. Few systems are so simple but that we can identify parts that in turn are made up of parts themselves. So, we have the problem of what to call part, and what to call whole. For our purposes, we shall think of the cells in the human organism as parts, and the individual himself, or any grouping of cells, as the whole. How science deals with cells, nowadays, falls in a quite distinct category from what is dealt with in studying muscle groups, or in the gross features of nerve conduction, etc.

If, then, a change in performance of the individual as a whole occurs, we can assign that change either to a change in the cells themselves, or to the functional interrelations between the cells, or to both. Since it is known that cell processes and states are always undergoing some sort of change, it might be thought that whatever is manifested by the organism as a whole is always to be assigned directly to cell function. For our purposes, the logic demands that only the extreme cell changes which conventional thinking would put into the category of fatigue shall be considered. In short then, we can speak of interrelational changes *between* cells and internal changes *within* cells. The latter we shall call *impairment*. Thus all the phenomena we are interested in fall into two classes, disorganization, and impairment.

Fatigue belongs, then, to the category of disorganization, and must be kept distinct from impairment in our thinking. As examples of impairment, we have hypoglycemia, anoxemia, and anhydremia. In each of these cases some constituent which the environment must supply is largely lacking, and cell metabolism cannot proceed normally. Some impairment conceivably develops during certain kinds or amounts of exertion. Impairment, however, is not necessarily at the bottom of fatigue. And fatigue may exist in the absence of impairment. One of the best examples of the relative independence of fatigue and impairment is the case of anoxia, or acute oxygen lack. During the development of anoxia, the individual becomes progressively less able to perform both motor and intellectual tasks. Sufficient oxygen lack brings on cyanosis, rigor, and collapse. During the progress of anoxia, the individual is likewise less and less able to *recognize* his predicament. He may become depressed, or he may become euphoric. He is likely to think that he is doing well in some performance in which he is failing miserably. Seldom does he report fatigue, or even admit to it, when questioned. In the cases in which euphoria and optimism exist, we have a very definite demonstration of the existence of a marked degree of impairment without concomitant fatigue. The argument that the individual is not up to par in his ability to estimate his own condition is no argument against the assertion that fatigue does not exist. In fact, it is in favor of the idea that fatigue requires some degree of self-evaluation. It requires that the individual be cognizant in some way or other of his own inadequacy.

There are many common cases in which fatigue develops either in the absence of any great degree of impairment, or at a rate much different than that of impairment. For example, an individual who a few minutes before was feeling quite well and energetic can be made very tired when confronted with an unpleasant and arduous obligation. The feeling of aversion, discomfort, insufficiency, or inadequacy, in such a case may have virtually all, if not all, of the properties that exist during and following an extended period of actual work. On the other hand, many of the predominant effects of actual work may be quickly wiped out by confrontment with new situations that are extremely attractive and pleasant. In fact, there is no relation between amount or kind of work done and the subjective end-result. To determine anything about the latter, one must know the individual, his past history, his tastes, etc. He alone is the arbiter.

When once we have it clear that fatigue and impairment are dis-

tinct, and that the individual is never able to tell by introspection whether he is impaired, we shall have gone a long way. Only biochemical or other physiological means appropriate to determine cell function are proper and adequate to identify impairment. There are times when an individual may feel so tired that he is virtually ill, and yet this is no absolute demonstration that he is greatly impaired, unless we mean that his *overt performance* is impaired. There are ways to show that a very quick recovery may be made from such a state as this—the rate being so rapid or sudden that the usual concepts of cell recovery hardly cover the situation. The requirements for rapid recovery include the ability to divest oneself from virtually all feeling of obligation. This may be accomplished, for example, by lying down, relaxing, and imagining that one really does not even have to move a muscle. That one does not have to respond to anything: not even a spoken word; a telephone bell. Soon the very bodily feelings will change and even though they may not disappear they take on a vastly different significance. These feelings are no longer a sign of inadequacy, for the situation carries no obligations. One cannot interpret his feelings as signs of inadequacy for work unless he contemplates the idea of work.

Granted that fatigue is one species of disorganization, it is the kind of disorganization that makes the individual inadequate, in his own estimation, for the task at hand. He may be inadequate by reason of the discomfort the pursuit of the task involves. He may be inadequate by virtue of the ideational or emotional disharmony that is involved. He may be inadequate by virtue of opposing habitual or reflex tendencies brought into play.

The central concept in describing and dealing with disorganization is that of conflict. Conflict is the term that labels the fact that in any but a perfectly smooth functioning system certain activities clash with each other in ways that are not readily resolvable. Nothing that could be called a new equilibrium, or compromise activity is readily reached.

In connection with conflict there is the second concept, that of frustration, the name for the internal situation when conflict becomes prolonged. Even in the most disrupting situations, some kind of overall activity in the organism continues, following the collision of two or more subactivities. When the result is a kind of activity not in line with the positive principles governing the continuity of the individual, he is deflected (frustrated) and acts in ways which are substitutional. The greater the discrepancy between the dominant or central alignments and the substitutional activity, the greater the frustration. Fatigue is

one kind of response to frustration. In fatigue there are always two opposing tendencies or considerations, to begin or continue activity, or to terminate it. The most severe fatigue arises when there is need to act and it seems entirely futile to do so. The conceived futility is translated into bodily insufficiency. The pattern of bodily function is much the same as when continuing a task under bodily discomfort from exertion.

Whereas, it may be convincing to say that one can be made to feel very tired and worn from confronting a task obligation that has very unpleasant social or other significances, the question still might be asked as to why and how one becomes tired from carrying on certain rather apparently easy performances, the significance that to the doer seems to be more or less neutral. One may extend this to ask why one always gets tired eventually no matter how simple or how easy the task is at the outset.

So-called simple tasks are calls to uniformity of behavior. Since complexities of movement or other processes are demanded even in the simplest performances, the uniformity consists in being required to repeat these patterns of movement again and again. The work is to be achieved by varying performance only within limits.

The organism is protected from becoming a perpetual automaton endlessly repeating the same thing over and over again. The fact that the stimulus situation is an ever-changing flow provides part of this protection. The fact that the organism possesses many very delicately balanced tendencies to action in opposing directions makes it certain to vary its behavior from instant to instant. Only the ability to maintain a constant overall alignment and to recognize long-term obligations prevents the organism from being a very fickle kind of a system. A clash between the tendencies toward disintegration of alignment and variability of performance and the opposing factors just mentioned is always involved in pursuing a prolonged task. Incidental to this clash, inefficient performance extraneous to the pursuit of the task becomes characteristic. These involve progressive lack of accomplishment and sensory discomfort. Fatigue is the individual's stance to these.

From what we have already said, there should be nothing essentially different between visual fatigue and fatigue in any non-visual situation, except that it arises in the use of the eyes. Our questions from here on then should center around the nature of visual performance and visual demands, and how they relate to the overall activity of the individual. We ask what there is about seeing that may be frustrating either

by virtue of the development of various forms of discomfort or failure to achieve.

The experimental demonstration which I wish to use to demonstrate conflict and frustration is the following:

Let two light sources, each about 30 degrees from the line of regard, but on opposite sides of it, be set up in an otherwise dark room. Ask the individual to fixate upon an imaginary point midway between the two light sources and hold that fixation until told to stop.. Let the period be 5 minutes. The task is, of course, an impossible one in man possessing a foveated retina with a gradient of sensitivity from fovea to periphery, but it is a task in which the impossible can be attempted.

In the attempt to hold fixation, we have one of the most clean-cut examples of opposing tendencies in any mechanism. Only strong stimulation, or the will to fixate, will halt the roving, and neither will hold it for very long. The result cannot be a passive steady equilibrium, for the more effort that is put into trying to accomplish this the greater the opposing innervations. Each type of innervation, at instants, catches its antagonist off guard and the result is the overshooting of movement in the opposite direction. Nystagmoid movements develop and finally the difficulty does not stop even there. Innervation radiates into non-visual channels and soon the individual is tense all over, becoming restless and fidgety. Squirming and other gross bodily outlet movements ensue, and the difficulties involved in the task may reach the point of intolerance. It is obvious that this task when continued would be fatiguing.

While this example represents an extreme situation, a significant degree of conflict exists in many everyday situations. Fixation that may be almost spontaneous when momentary, becomes a matter of conflict when carried very far. The most common situations of all are the various forms of task demanding continued close vision. Steady fixations or limited forms of eye-movement, predominate macular vision, and high degrees of visual acuity, are demanded.

That fatigue, in any case, can be called *visual* fatigue depends upon whether it can be shown to depend upon the use of the eyes. The fatigue itself is essentially the same in any case, for as I have attempted to emphasize, it is a personal stance toward activity. In being personal it does not fail to possess full-fledged somatic sensory components expressing inadequacy, and though somatic it certainly includes the individual's evaluation of himself with reference to meeting obligations. In short, fatigue should be a psychosomatic concept in the truest sense of the term.

The problem then in applying the concept of fatigue to difficulties which arise in visual performance is wholly a delineation of the visual mechanisms—neural, oculomotor, perceptual, etc., and a determination of how these mechanisms can become involved in the individual's disorganization and frustration.

When an eye or pair of eyes develops symptoms of discomfort or fail to do what the owner wishes them to do, even conventionally, it is not difficult to apply the terms strain and fatigue, if he has been employing his eyes in a special task. But the situation is more subtle when visual perception rather the oculomotor performance and ocular discomfort underlies fatigue. The connection may be not at all obvious to the fatigued individual. Despite the obscurity of connection between perceptual difficulties and fatigue, we have reason to believe in the existence of such a relation.

When conflicting sensory stimuli are involved, effector mechanisms become involved, and the conflict is often most predominantly expressed in skeletal muscle terms as if the individual had been participating in muscular exertion.

It all sums up to saying: (1) That discomfort and oculomotor symptoms are not fatigue and may even exist in the absence of fatigue; (2) That visual fatigue may exist without oculomotor symptoms or symptoms of ocular discomfort; (3) That ocular discomfort and oculomotor symptoms may lead to fatigue; and (4) fatigue originating from other sources of frustration may in turn involve the visual apparatus. The order of events, and what the specific features are in any case, must be discovered for that case.

In fact, the interrelations between the four phenomena, oculomotor performance, discomfort, fatigue, and the participation of collateral somatic systems, such as the gastro-intestinal tract, and the circulation, must henceforth receive proportionately much more attention than heretofore.

Although the major portion of what I have said is focused on fatigue rather than impairment, both of these features must be studied in light of each other. While impairment more or less represents the aspect of human difficulty that is chronic, or cannot well be changed, fatigue as a type of disorganization represents a category of human function that is subject to change. It is in connection with fatigue that various forms of change induced by training and practice find a use. He who abandons the energetic notion of inadequacy of performance and recognizes that performance depends upon organization of interrelated parts

is prepared to see fatigue as an end-result of disorganization. He is prepared to expect progress from an entirely different line of research than has borne the fatigue label heretofore.

It must be recognized that we have little in the form of accomplished research in this direction to offer as yet. The excuse for the paper I have just given is the presentation of the view, and the hope that it will point the way to insights and information beyond those we now possess.

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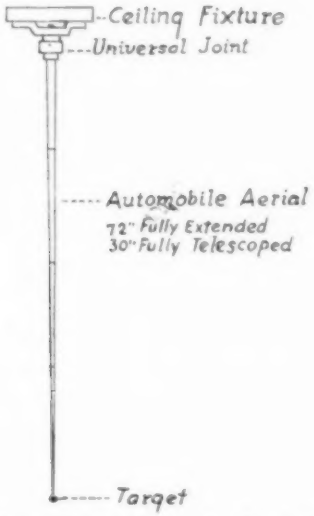
A SIMPLE FIXATION TARGET FOR USE IN CONTACT LENS FITTING*

M. H. Kauhl and D. G. Hummel†
Cleveland, Ohio

Originally the authors used four different methods of setting up a fixation target for contact lens impressions:

1. A spot of light focused on the wall or ceiling.
2. A target attached to the wall or ceiling.
3. A target held in the hand of an assistant.
4. A target held on the cross arm of a floor stand.

The following problems were noted. In the first two methods the distance of the target from the patient resulted generally in poor fixation due to blurring. The problem of phorias seemed to be greater than in methods three and four.



The target generally remained steady for a limited time in the third method but this required a second assistant. Number four was satisfactory, but the instrumentation required floor space close to the patient and interfered with the free movements of the assistant.

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†Optometrists. Fellows, American Academy of Optometry.

It was felt that a target hanging from the ceiling would solve the foregoing objections. The target evolved consists of an automobile aerial hung from the ceiling on a universal joint. The colored button at the end is used as the fixation target. This can be varied in color or a small electric bulb can be substituted. Additionally a small white dot can be placed on the target to aid fixation.

The target is placed on the ceiling so that the universal joint is about in the position of the waist line of the patient reclining on the table. This allows for maximum positioning of the target without interference to the patient's fixation or the movements of the operators. The telescoping arm enables the target to be placed well out of the way when not in use. With this target as with all others used it has been found best to have a plain wall background to aid fixation, any other type caused a wandering of the fixating eye.

The following advantages have been noted:

1. Convenience of use.
   (a) no floor space needed.
   (b) no interference to the assistant.
2. Since the target can be brought as close as necessary to the patient the ease of fixation is greatly improved. This has been confirmed repeatedly by the patients and the observed patient reaction.

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TREND WITHIN A.O.A. TOWARDS OBSERVANCE OF ETHICAL REQUIREMENTS OF PRACTICE

Step by step, the American Optometric Association is slowly joining with the American Academy of Optometry in its insistence that all optometrists must practice professionally and that infractions of the rules of ethical conduct cannot be overlooked.

This somewhat belated trend toward the only acceptable goal—unequivocal professionalism—is most clearly revealed by recent writings of A.O.A. spokesmen on the subject of ethics and economics for optometrists.

These spokesmen, whose recommendations were used as a basis for

drawing up the recently adopted A.O.A. Code of Ethics,[1] indicate that they now consider any form of direct solicitation of patients unprofessional. It is equally unprofessional, they say, to procure patients by indirection through solicitors or agents or by indirect advertising of any kind. Self extolment of any kind is denounced by these men.

They point out that the most worthy and effective advertisement possible, even for a young optometrist and especially with his fellow practitioners, is the establishment of a well-merited reputation for professional ability and reliability. This cannot be forced, they emphasize, but must be the outcome of character, conduct and skill.

It is recognized that an optometrist, in establishing a practice, at the outset may present himself to those who need his services, and the A.O.A. spokesmen urge that this be done with dignity and propriety.

The A.O.A. spokesmen indicate further that the publication or circulation of simple business cards, being a matter of personal taste or local custom and sometimes of convenience, is not in itself improper. To disregard local customs and to offend recognized ideals in publishing or circulating such cards is unprofessional, however, they point out.

It is unprofessional, they continue, to promise radical benefits, to boast of successes or secret methods of care, to exhibit certificates of skill or of success in the treatment of visual difficulties or to employ any similar methods to gain the attention of the public for the purpose of obtaining patients.

Returning to the subject of advertising, these writers further point out that one of the most characteristic differences between the professions and the non-professional vocations is expressed in the simple and uncompromising statement above, prohibiting the professional man from soliciting patients by advertising. Optometry cannot condone any compromising with the above principles which prohibit advertising by any means whatsoever except the "establishment of a well-merited reputation for professional ability and fidelity," i.e., word which is spread in person from one satisfied patient to another.

They admit that it is true that professional men must conduct their practices on sound economic principles if they are to survive—but when they build their practices on a foundation of paid advertising, they are no longer professional men but merely business men or tradesmen. Paid advertising is the very root and branch of any business enterprise, while in contrast a professional practice is built exclusively on what might be called "free advertising," i.e., patient to patient referrals.

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[1]See Current Comments "A.O.A.-B.O.A. Ethics." Amer. Jour. Optom. and Arch. Amer. Acad. Optom., 24:4, 183-184, 1947.

They emphasize that the professional taboos against advertising also apply in the problem of "locating" an office. If an office is designed to attract "walk ins" through the advertising pull of its location alone, then this surreptitious advertising is just as unprofessional as a blatant newspaper advertisement would be.

They follow this up with the comment that window displays, neon signs, unshuttered expanses of plate glass in downstairs shop fronts are all designed to attract the eye of the passerby who has never heard of the owner and to pull him into the store. To "professionalize" downstairs and reconvert them into downstairs offices by removing all displays, shuttering the windows and removing all signs except the equivalent of a modest shingle goes a long way toward professionalism *but not* quite all the way. This coincides with the Academy attitude towards these first floor offices. The downstairs optometric office in a community where the reputable medical, dental and legal offices are universally found in upstairs locations is downstairs for only one reason. Such locating states that the owner hopes people who walk by the office will see it and walk in because of the advertising value of the location alone. He is willing to pay a substantial sum of money for this in the increased cost of his rent as compared with the equivalent upstairs office space.

In the same way, they point out, that trademarked commodities may be advertised to the public by the sheer repetition of the name of the product without any other sales message, the name and location of the downstairs optometrist are subtly but very effectively registered in the minds of the people in the community by the simple repetition of their passing by it day by day. This subtle form of paid advertising is undoubtedly sound from point of view of common commercial economics, but it is clearly unprofessional since its sole purpose is to attract patients by an advertising technique rather than through "the establishment of a well merited reputation for professional ability and fidelity."

The exception, of course, is in a small town where there are very few (if any) office buildings, and all of the professions are located downstairs without any loss of professional standing, since there is no unfair competition through the advertising value of a downstairs office. This, too, squares with Academy practice.

One of the most distinctive marks of a professional man in the eyes of these A.O.A. writers is his adherence to an elaborate set of special rules of etiquette which are binding on him as a professional man but which may be inapplicable to men in other fields. The rule against

advertising, self-laudation to gain a following and similar ostentation is one of the most common among the professions. It is so common that it is considered one of the hallmarks of a professional man.

In their closing recommendations they compare optometry and dentistry, pointing out that the profession of dentistry has formulated a set of rules concerning advertising that could well be the pattern for optometry:

"AS AN INDUCEMENT TO PATRONAGE IN THE PRACTICE OF DENTISTRY, it is unethical and unprofessional for a dentist to employ or permit the employment of handbills, posters, circulars, cards, signs, stereopticon slides, motion pictures, telephone, radio, newspapers, lectures, or any kind of printed or written publications or any other device for the purpose of

(1) Advertising personal superiority or ability to perform services in a superior manner.
(2) Advertising definite fixed fees which, in the nature of the professional service rendered, must be variable.
(3) Advertising statements that might be calculated to deceive or mislead the public.
(4) Advertising any one or more types of dental service, thereby implying either superiority or lower-than-average fees in these fields.
(5) Advertising under the name of a corporation, company, institution, clinic, association, parlor or trade name.
(6) Advertising special or allegedly exclusive methods of practice or peculiar styles of service.
(7) Advertising reports of cases or the possession of special certificates, diplomas, etc.
(8) Employing or making use of advertising solicitors, free publicity press agents, radio announcers, entertainers or lecturers.
(9) Guaranteeing or warranting operations.

"The fact of promulgation of any of the forms of advertising covered in this section shall be held to be satisfactory proof that the dentist named either employed or permitted the employment of the advertising message.

DIRECTORY ANNOUNCEMENTS

"It is unethical for a dentist to permit the placing of his name in any city, commercial, telephone, or other public directory or directories in public or office buildings, using what is known as display type or type that is in any way dissimilar to the standard in size, shape or color or to use any other device tending to give his name visual prominence over other names listed. It is likewise unethical for a dentist to permit the printing of his name in any kind of public directory under a heading such as 'Specialists,' 'Surgeon Dentist' or any other heading or device that might create in the mind of the reader the impression that the individual so listed is superior to those whose names appear under such a simple heading as 'Dentists' or 'Dental Surgeons.'

CARDS IN PRESS, ETC., SPECIALISTS

"In communities in which it is customary for professional men to insert a card in the local press, or in programs for social events, theatres, etc., the same custom may be observed by the dentist, but such cards must be a modest size and type and shall not include more than the dentist's name, title, address, telephone number and office hours, nor shall it include any other device tending to give such announcement visual prominence over other names listed. If he confines himself to the practice of a specialty, he may announce in modest type—'practice limited to —' (announcing the specialty) but nothing more. This Association, however, believes the latter custom to be unbecoming to professional men and urges its members to abstain from such practice."

While the A.O.A. failed to embody in its adopted code of ethics all of the proposed recommendations just reviewed, it did move rather

markedly toward the position taken by these spokesmen. The new A.O.A. code does not prohibit all newspaper advertising nor does it insist on real office quarters for all of its members, but it does at least urge these things and tightens up the standards for A.O.A. membership.

The Academy welcomes the efforts of the parent optometric body in these evident steps toward the full proper observance of professional rules of conduct on the part of A.O.A. members. In general, the new code is a good step in the right direction—one which should be followed by the A.O.A's insistence that real professional practice standards be rigidly observed by all A.O.A. members. The Academy has always required strict observance of its rules by its Fellows, with no regrets, and the Academy will welcome the day when the A.O.A. insists that all members of optometric societies, both state and national, observe the tenets of good taste.

CAREL C. KOCH.

TRANSACTIONS OF THE AMERICAN ACADEMY OF OPTOMETRY

A department devoted to announcements, reports, appointments, organization data, news, professional problems and ideals, as these relate to the Academy.

TWO NEW ACADEMY GRANTS-IN-AID

During July, the American Academy of Optometry, upon recommendation of the research projects committee, approved two grants-in-aid for visual research projects.

SCHOOL OF OPTOMETRY, OHIO STATE UNIVERSITY

A $1,500 grant was made by the Academy to the School of Optometry, Ohio State University, for research fellowship in physiological optics. This work will be carried out by Henry Knoll under the direction of Dr. Glenn Fry.

The money will be used to investigate the effect of low levels of illumination and freedom from optical stimulation of accommodation upon the refractive state of the eye. The investigation will be divided into two parts.

The first part will be concerned with the effect of removing optical stimuli to accommodation without changing the level of illumination. It is proposed to use a large white field with a diffuse border which is free from optical stimulation to accommodation but constitutes a target for controlling the fixation. The refractive status of the eye will be

determined by a method used by Reese,[1] which permits the refractive state of the eye to be determined without stimulating accommodation. The results obtained in this manner can be compared with results obtained when a group of letters are presented at the center of the white field and observed through various plus and minus spheres added to the correction for ametropia.

The second part of the investigation will be concerned with a determination of the role played by the level of illumination. It is a common experience that low levels of illumination produce what seems to be a refractive change corresponding to less hyperopia or more myopia, this phenomenon having been termed, "nocturnal myopia," and Knoll will attempt to determine whether a low level of illumination, per se, induces a change in the refractive status.

Supplementary experiments will be made to determine the role played by the aberrations of the eye.

According to Dr. Fry, this investigation has an important bearing on the general problem of night myopia and the technique of measurement of the refraction of the eye advocated by Luckiesh & Moss.[2]

SCHOOL OF OPTOMETRY, UNIVERSITY OF CALIFORNIA

A grant in the amount of $500 was made to the University of California for use by Dr. Meredith W. Morgan, Jr., of the School of Optometry. This is the second Academy grant of $500 to this school for research on accommodation-convergence relationships, the first being in June, 1945. A full report of the findings of Dr. Morgan's studies made with the assistance of this first grant may be found in his paper, "A New Theory for the Control of Accommodation," in the March, 1946, issue of this Journal, pages 99-107.

This second grant of $500 will be used for continuing and amplifying the study of accommodation-convergence problems. Dr. Morgan expects to investigate the effects of accommodation and convergence and accommodative-convergence on the size of the pupil. These functions will be controlled as carefully as possible using a specially equipped haploscope. The size of the pupil will be measured by infra-red photography. The targets for various fixation distances will give use to retinal

1. E. E. Reese, M.Sc. Thesis of the Ohio State University, An Investigation of the Use of Contrast Theshold Targets for Measuring Spherical Errors of Refraction (1939).

2. M. Luckiesh and F. K. Moss, The Avoidance of Dynamic Accommodation through the Use of a Brightness Contrast Theshold, Am. J. of Ophthalmology, 20, 469-478 (1937).

images all having the same physical size as far as area covered and the same retinal illumination.

The data thus gathered will be analyzed by Dr. Morgan, by statistical methods, in the hope of getting a correlation of significance with either accommodation or convergence or accommodative-convergence.

Following this preliminary study, a study on rates of response will be made by Dr. Morgan in order to determine if possible which function is the first to respond.

ANNUAL MEETING

CHICAGO ACADEMY CONVENTION REGISTRATION

Once again that war-born admonition to travelers—"make your reservation early"—is in order for Academy members.

Chicago's Palmer House, the hotel chosen for the 1947 annual meeting of the Academy, informs us that preliminary arrangements for the coming convention have been completed and reservations will be accepted starting immediately.

Reservations should be addressed to "The Palmer House, Chicago, Illinois." Be sure to mention you are an Academy member as the hotel has blocked off a special group of rooms for the convention. The dates: December 13, 14, 15 and 16, 1947.

A word about the convention itself. Considering the short time it has been since their appointment, convention committee members have made remarkable progress. For some Academy members, the Chicago convention will be the second or third big optometric meeting they have helped arrange this year, but that fact hasn't decreased either their enthusiasm or their efficiency and Academy members can look forward to an outstanding meeting.

Dr. Harold Simmerman and his program and papers committee already have most of the program outlined. This program will be in the October issue of the Journal.

ACADEMY SECTIONS

With more and more optometrists turning to specialization, the section meetings of the Academy annual program are becoming increasingly popular. To meet this increased interest even more time and effort than heretofore will be spent in planning the section meetings for the 1947 convention in Chicago. Dr. Harold Fisher reports he has appointed the following Academy members to take charge of this planning.

Aniseikonic Section

Chairman, Dr. Robert E. Bannon, Hanover, New Hampshire; Committee members: Drs. O. L. McCulloch, Holyoke, Massachusetts; Rudolph T. Textor, Cranford, New Jersey· and Dr. Howard C. Doane, West Roxbury, Massachusetts.

Orthoptic Section

Chairman, Dr. Daniel Woolf, New York, New York. Committee members: Dr. J. Donald Kratz, Souderton, Pennsylvania; Dr. A. E. Hoare, Los Angeles, California; Dr. Glenn H. Moore, Chicago, Illinois; Dr. Kenneth B. Stoddard· Berkeley, California; Dr. R. W. Tubesing, Richmond, Virginia, and Dr. M. N. Chodroff, New York, New York.

Contact Lens Section

Chairman, Dr. John C. Neil, Philadelphia, Pennsylvania. Committee members: Dr. D. G. Hummel, Cleveland, Ohio; Dr. S. G. Weiss, Torrington, Connecticut; Dr. Jerome B. Conlogue· Peoria, Illinois; and Dr. Isadore S. Finkelstein, New York, New York.

LIBRARY-MUSEUM COMMITTEE

Shortly after the Philadelphia meeting, a proposal was made to the Executive Council by Dr. E. LeRoy Ryer, New York City, that the Academy consider establishing a library of rare books, and a museum of optical equipment and instruments.

Dr. Henry W. Hofstetter of the School of Optometry, Ohio State University, Columbus, Ohio, has offered the facilities of the school for housing such an Academy collection without cost to the Academy, and to serve as curator of the collection without compensation.

There would, of course· be some cost to the Academy in the purchase of rare objects for the collection.

Dr. Fisher has appointed the following Academy members to serve on a special committee to study this entire question and report back to the Executive Council: Dr. E. LeRoy Ryer, chairman; Dr. H. W. Hofstetter, and Dr. Richard M. Hall.

CHAPTER ACTIVITIES

ILLINOIS CHAPTER

Dr. Eugene Freeman of Chicago was elected president of the Illinois Chapter on Friday, July 11. This meeting was the first held since this chapter was granted a charter.

Other officers elected were as follows: Dr. Harry Pine, Chicago, vice-president; Dr. W. T. Stevesson, Chicago, secretary-treasurer. An executive council was also elected, Dr. John T. Peterson of Rockford and Dr. Jerome Conlogue of Peoria being named to serve as members.

The chapter took in 10 new members, and 11 additional names were proposed as possible candidates for Fellowship.

CHAPTERS AND OFFICERS

Inquiries about joining local chapters often are received in the Journal office. Many times these questions can best be answered by someone from the local chapter itself, and for this reason, we are publishing at this time a complete list of Academy chapters together with their current officers:

COLUMBUS CHAPTER

President: Dr. E. E. Reese, Westerville, Ohio
Secretary: Dr. Wm. Inskeep, Columbus, Ohio

CUYAHOGA ACADEMY OF OPTOMETRY

President: Dr. D. G. Hummel, Cleveland, Ohio
Secretary: Dr. A. A. Schmidt, Cleveland, Ohio

EASTERN PENNSYLVANIA CHAPTER

President: Dr. Wm. O. Vivian, Media, Pennsylvania
Secretary: Dr. Wm. G. Walton, Jr., Merion, Pennsylvania

ILLINOIS CHAPTER

President: Dr. Eugene Freeman, Chicago, Illinois
Secretary: Dr. W. T. Stevesson, Chicago, Illinois

INDIANA CHAPTER

President: Dr. R. W. Tubesing, Richmond, Indiana
Secretary: Dr. J. R. Shreve, Indianapolis, Indiana

IOWA CHAPTER

President: Dr. George H. Warkentine, Cedar Rapids, Iowa
Secretary: Dr. Dawson E. Grim, Cedar Rapids, Iowa

MARYLAND CHAPTER

President: Dr. Wm. H. Engel, Baltimore, Maryland
Secretary: Dr. Alton G. Billmeier, Denton, Maryland

MICHIGAN CHAPTER

President: Dr. D. C. Thompson, Detroit, Michigan
Secretary: Dr. G. D. Rowe, Dearborn, Michigan

MINNESOTA CHAPTER

President: Dr. Rudolph Ehrenberg, Granite Falls, Minnesota
Secretary: Dr. Carel C. Koch, Minneapolis, Minnesota

NEW JERSEY CHAPTER
President: Dr. Julius Neumueller, Haddonfield, New Jersey
Secretary: Dr. George L. Brown, Paulsboro, New Jersey

NEW YORK ACADEMY OF OPTOMETRY
President: Dr. John W. Mogey, Flushing, New York
Secretary: Dr. David Kravet, New York, New York

SOUTHERN CALIFORNIA CHAPTER
President: Dr. John R. Dean, Los Angeles, California
Secretary: Dr. E. Clarke Deacon· Los Angeles, California

VERMONT-NEW HAMPSHIRE CHAPTER
President: Dr. Laurence P. Folsom, South Royalton, Vermont
Secretary: Dr. L. G. Chase, Springfield, Vermont

ANNOUNCEMENTS

O'BRIEN APPOINTED ADVERTISING MANAGER

BROOKINS CONTINUES WITH PRODUCTION

William H. O'Brien

Harry B. Brookins

Last month, the Journal had the good fortune to obtain the services of Dr. Robert E. Bannon, staff member of the Dartmouth Eye Institute for 12 years, as our Research Editor.

This month, another important change takes place on the Journal staff.

Since 1928, all advertising matters and the hundred and one details that accompany printing a magazine have been more than ably supervised by Harry Brookins, our advertising and production manager. Gradually, however, the Journal has grown from a small magazine to one of international circulation, and the increased volume of production and advertising work can no longer be handled in one department. Because of this added volume, advertising and production have now been divided into two separate departments.

Advertising matters will be handled by William H. O'Brien, and production — makeup, printing, binding and mailing — will remain under Mr. Brookin's supervision.

O'Brien, a young man with considerable journalistic and advertising experience, joined the Journal staff August 10. He is a graduate of St. Thomas College, St. Paul, Minnesota, where he majored in journalism. After leaving college, he became advertising manager of the International Falls Daily Journal, International Falls, Minnesota, and subsequently did editorial and advertising work for Modern Medicine publications, Minneapolis.

CAREL C. KOCH

CURRENT COMMENTS

Virginia Huck
Editorial Assistant

Optometrists will confer a favor by sending news items of general interest for this department; such as relate to new instruments, clinical techniques, education, visual health and optometric legislation and organization.

S.O.S. BOOK DRIVE

"SOS" has taken on a new meaning. A meaning as serious, however, as the old one. The new SOS stands for "Surplus for Overseas Survivors"—the slogan adopted by the American Jewish Joint Distribution Committee, Inc., a group which is endeavoring to help displaced persons in Europe get back on their feet physically, spiritually and intellectually.

To accomplish the latter, the committee is asking that United States optometrists aid in bringing displaced European professional persons up-to-date on refractive progress during the last ten years, by donating to them any textbooks, journals, charts and reprints which can be spared from their own libraries.

Already more than 60,000 textbooks, journals, charts and re-

ports have been donated by medical schools and individual doctors, but virtually an unlimited number are needed, according to the committee.

Contributions should be sent directly to the SOS warehouse, the American Jewish Joint Distribution Committee, Inc., 1539 Troy Avenue, Vanderveer Park, Brooklyn, New York, for sorting, processing and packing for shipment overseas to a D.P. camp, child care center, hospital or school.

BETTS AND HACKMAN REVIEW MYOPIA PROJECT

The evaluation of the controversial Baltimore myopia project co-authored by Professors Emmett Albert Betts and Roy B. Hackman of Temple University, Philadelphia, is now available in reprint form, according to a letter from the University. These papers appeared originally in the Journal of the American Optometric Association early this year. For copies, write the Division of Research and Publications, Department of Psychology, Temple University, Philadelphia, 22, Pennsylvania.

A.O.P. REVAMPS JOURNAL

A new British magazine, "The Optical Practitioner," has now replaced the former "AOP Bulletin" as the official journal of the Association of Optical Practitioners. This group was formed last year by the amalgamation of the Joint Council of Qualified Opticians and the Institute of Ophthalmic Opticians, and has a membership of over 4,000.

In the words of the acting editor, S. Black, the journal came into existence because, "The Association requires a journal to provide information for members on all matters that concern the practice of ophthalmic optics—to serve as an 'open forum'—to present our views to members of the government and the allied professions."

Editor Black could have added one more function of such a journal —to keep interested American practitioners abreast of British optometric activity—because his statement in the first issue that "there is a very real interest among American optometrists in everything that British opticians are doing," is very true.

This magazine has been added to our list of magazines abstracted each month so that our readers may keep current on news of the AOP.

RHODE ISLAND MEETING

The Rhode Island Optometric State Convention will get under way at the Narragansett Hotel, Providence, Rhode Island, Sunday, September 21, and continue through Monday the 22nd.

This year's speaker will be Dr. Carl W. Lange of St. Louis, Mis-

souri. Topics for discussion include squint, amblyopia, hyperopia, myopia, suppression, fusion and stereopsis.

Further details are available from either Dr. Aime Thuotte, 1211 Main Street, West Warwick, Rhode Island, or Dr. Richard I. Albert, 69 Broad Street, Pawtucket.

OCULAR CHARTS

Patients who are happier when they are given more than a verbal explanation of what's wrong with their vision have always been, and probably always will be, on your appointment sheet. These patients are entitled to the consideration they demand, and most practitioners have some sort of chart on hand to show them while explaining the problem.

Two such charts recently came to our attention which seem to fit the bill for the technical minded patient. They are published by the Rudolf Schick Publishing Company of New York City.

On these charts the reproduction of the eyes has been made on linen and the linen mounted on rollers for convenience as the drawings are large, each chart measuring 2½′ x 3½′.

One chart (No. 3) deals with vision, and shows three side views of the eye, illustrating, among other things, the position of the visual axis and the plane of regard in (1) the normal eye, (2) the myopic eye, and (3) the hyperopic eye. Also diagrammed is the effect of proper corrections for myopes and hyperopes. The various parts of the eye are, of course, clearly identified.

The second chart (No. 14) is divided into two parts: (1) a view of the left eye from the front, with the various protective tunics of the eye clearly identified, and (2) an "airplane" view of the brain and eyes, illustrating the relation of sight to the brain.

Both charts are elaborately detailed in color.

HOSPITAL APPOINTMENT

Through the Pennsylvania State College of Optometry we learned this month that Dr. Lawrence A. West, one of their graduates, has been appointed to the staff of the Eye Clinic of the Medical Center, the largest hospital in New Jersey.

This is an important appointment in that Dr. West is the first optometrist to be associated with this hospital. He will supervise all orthoptic, refractive and physical aspects of ophthalmology.

Dr. West has been in private practice in Jersey City, New Jersey,

since his graduation from Penn State, specializing in orthoptic and refractive optometry.

EDITOR VISITS JOURNAL OFFICE

First quality ophthalmic lenses and frames are still on the hard-to-get list in South Africa, as well as other countries depending upon exports from Great Britain.

That was the picture of the current supply situation painted by Dr. Jack Raphael, Johannesburg optometrist, during a visit to the Journal office July 10.

Dr. Raphael, who edits and publishes the quarterly, "The South African Optometrist," in addition to practicing, expressed the hope that he could make arrangements with American optical manufacturers to supply him with some of the ophthalmic material which has been scarce for so many years.

It was the acute shortage of this material during World War II that led Dr. Raphael into the manufacturing of contact lenses and artificial eyes. He has since become known for his technique of inserting specially made colored glass irises into plastic artificial eyes which give them a more natural look.

Dr. Raphael came to the United States with his wife to visit the Mayo clinic. He has been practicing optometry in Johannesburg since 1921, and is one of the leading optometrists in that area.

ABSTRACTS

A department in which will appear abstracts of the literature of optometry, ophthalmology and applied optics. These will be classified according to the following list although contributions to all sections will not necessarily appear in each issue.

1. Ocular Refraction.
2. Physiological Optics and Color Vision.
3. Ocular Muscles.
4. Orthoptics and Reading.
5. Anatomy, Histology and Embryology.
6. Ocular and General Pathology.
7. Ophthalmic Lenses and Material.
8. Instruments.
9. Hygiene and Illumination.
10. Applied and Physical Optics.
11. Education, Sociology and Economics.
12. Miscellaneous.

1. OCULAR REFRACTION

NOTES ON INDIRECT OPHTHALMOSCOPY. L. A. Swann. The Optician. (London). 1946. 112. 2888. 5-6.

The author reviews the general technique of indirect ophthalmoscopy and points out that since self-luminous ophthalmoscopes are now in common use the practice of indirect ophthalmoscopy has fallen into disuse. Swann believes this to be a mistake and a serious loss to optometrists. He claims it is always well to have two or more procedures to lean upon as in some specific case the second technique may prove of greater value than the first. He points out, for instance, that

in cases of nystagmus, the indirect method is vastly superior to the direct and this, he asserts, is also true when examining the fundus of babies with large pupils.

The technique of indirect ophthalmoscopy outlined by the author is the usual one found in most textbooks dealing with the fundus.

C. C. K.

ANESTHESIA IN CONTACT LENS WORK—AN EVALUATION. R. Graham. The Optometric Weekly. 1947. 38. 7. 229-230.

The author describes a series of tests made on three subjects in which molded contact lenses were fitted both with and without anesthesia. The impressions were made with moldite. Results showed that:

(1) The patient experiences no pain whether the mold is made with or without anesthesia.

(2) The patient at first is more apprehensive when no anesthesia is used but this fear passes away quickly.

(3) Without anesthesia there is less danger of damage to the cornea as the patient quickly reports injury to the optometrist in the event of a corneal scratch.

(4) Patients who have had molded impressions made both ways prefer having this work done without anesthesia.

C. C. K.

ANISOMETROPIA AND ITS CORRECTION BY CONTACT LENSES. H. T. Billger. The Pennsylvania Optometrist. 1945. 5. 6. 12-13.

The author presents two case reports in which high anisometropia was successfully corrected by means of contact lenses. In each of these histories ophthalmic corrections had failed, but with contact lenses binocular vision was achieved. The first case was a post-operative cataract case, the other was one of high myopia.

C. C. K.

PROFESSIONAL APPROACH TO THE BIFOCAL PROBLEM. E. Laisne. The Optical Journal and Review of Optometry. 1947. 84. 2. 35-36.

When, in the opinion of the examiner, they are needed by the patient, bifocals should be prescribed. It is a mistake, says Laisne, under such circumstances, to merely suggest their use and leave the decision to

the patient. The optometrist should make the decision and stick to it! In addition, he believes bifocals should be prescribed as early as needed even in those cases where the patient's major need for visual assistance is only at the near-point. Bifocals, he brings out, are easy to use with low reading additions and are more satisfactory to the patient than a reading correction which has to be removed and replaced constantly throughout the day.

C. C. K.

CONTACT LENSES AS A SUPPLEMENTARY PAIR. J. I. Pascal. Midwest Optometric Journal. 1947. 14. 4. 9.

The author doubts that contact lenses will displace glasses but believes they will, in time, attain wide popularity as a supplementary aid to glasses to attain normal vision.

T. O. B.

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4. ORTHOPTICS AND READING

ORTHOPTICS IN EVERYDAY PRACTICE. S. Black. Optics. (Glasgow, Scotland). 1947. March. p. 3.

Cases of binocular instability requiring orthoptics are so common in general optometric practice that these visual abnormalities must be treated in the course of every day activity. The author feels it is a mistake to attempt to divorce refractive and orthoptic work. Every optometrist, says Black, should be familiar with orthoptic procedures and should carry these through in those cases which require these treatments.

T.O.B.

APPLYING PSYCHOLOGY TO PATIENT-PERSONALITY. M. I. Blanchard. The Optical Journal and Review of Optometry. 1947. 84. 6. 41.

Blanchard believes that orthoptics should not be prescribed for patients with low I.Q.'s, and that optometrists should make an effort to determine the patient's mental ability before resorting to visual training procedures.

T.O.B.

VISUAL TRAINING. Leo J. Lemoi. The Journal of the New York State Optometric Association. 1947. 14. 6. 2-3.

The author reviews the 13 steps usually followed in the orthoptic training of patients by the Ann Sutton Nichol's technique.

These steps are: (1) monocular rotations, (2) monocular fixa-

tions, (3) monocular accommodation, stimulative phase for building amplitude, (4) accommodative rock inhibitive training, (5) calisthenic series for training accuracy of fixations and establishing projection to the same plane through equal spheres, (6) cheiroscopic drawing, (7) binocular training for teaching perception of tri-dimensional objects and their relationship as to size, position and distance in space, (8) Tel-Eye-Trainer with B. U. Series of targets for teaching further perception of contour objects and their size, position and distance in space, (9) rapid binocular flash and disparator training through plus or minus to teach projection and subsequent acuity, (10) stimulation of central field and securing greater acceptance of plus by means of targets A N 87 to 102 with rotor, (11) further rotor training to establish a pattern for projection, stereopsis and acuity in the central field in space, (12) test for readiness for pointer training, and (13) pointer training.

T.O.B.

UNILATERAL HIGH MYOPIA. London Refraction Hospital Clinical Report. The Optician. (London). 1947. 113. March 28. p. 145.

A case report of a patient, age 10, with a serious amblyopia in the heretofore uncorrected left eye is reported. The findings showed the following correction was required.

O.D. + 0.75 D.Sph ⌒ — 1.00 D. Cyl. axis 175. V.A. 6/7.5
O. S. — 9.00 D.Sph ⌒ — 4.50 D. Cyl. axis 10. V.A. 6/24

The patient still suppressed the vision of the left eye but with orthoptic training on the Pigeon-Cantonnet stereoscope, a fair degree of binocular vision has been attained, the final V.A. being O.D. 6/7.5, O.S. 6/18, O.U. 6/6.

C. C. K.

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6. OCULAR AND GENERAL PATHOLOGY

THE RESPONSIBILITIES AND OPPORTUNITIES OF THE OPTOMETRIST IN EYE INJURY CASES. Harold G. Noyes. The Columbia Optometrist. 1946. 20. December. 4-5.

Noyes suggests that optometrists engaged in industrial eye work include in their routine check of workers' eyes the following tests: (1) visual acuity, (2) a check of the horizontal visual field, (3) test for diplopia, (4) an external ocular inspection of the workers' lids, particularly the conjunctival surfaces by eversion of the upper lid, (5) an examination of the bulbar conjunctiva, (6) the cornea, (7) the

anterior chamber, (8) an ophthalmoscopic examination of the lens particularly for signs of traumatic cataract, (9) the vitreous, and (10) the fundus. In items 4 through 10, focal illumination and the ophthalmoscope are indispensable.

In industrial eye cases the optometrist is to refer the injured worker to the ophthalmologist after supplying first aid by (1) washing out the foreign matter with a saline solution, or, (2) instilling castor oil in the eye after ocular burns.

C. C. K.

DIAGNOSIS AND CONTACT LENS CORRECTION OF KERATOCONUS. S. M. Braff. Optical World. 1947. 35.4. 32-36.

The author reviews the etiology and prognosis of keratoconus and presents the diagnostic characteristics of the disease. He suggests the use of contact lenses to overcome the corneal abnormality and states that these lenses can usually improve vision in the non-complicated case up to 90 per cent of normal.

A. V. H.

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7. OPHTHALMIC LENSES AND MATERIAL

A NEW CONTACT LENS. A. J. Forknall. The Optician. (London). 1947. 113. May 30. p. 365.

A new two-piece contact lens is described by the author. The removable corneal segment is attached to the scleral portion by a new process which permits the corneal segment to be easily changed from the original fitting plano to a corrected lens which meets the final requirements of the patient. With this process the finished correction has exactly the same distance between the anterior surface of the cornea and the posterior surface of the corneal segment of the contact lens, thus affording no variation in the depth of the liquid lens or consequent change in refractive power.

C. C. K.

CONTACT LENS ADJUSTMENTS. J. C. Neill. The Optometric Weekly. 1947. 38. 10. 341-343.

The author describes the office laboratory techniques required to make minor adjustments properly in plastic contact lenses as these relate to the size and shape of the lens. The equipment and supplies needed for this work are reviewed by the author and he points out proper techniques are needed because a contact lens whose periphery is

either too tight or too loose is apt to result in the patient using the lens in a more or less decentered position.

T. O. B.

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9. HYGIENE AND ILLUMINATION

EXPERIMENT IN CONTACT LENSES. Henry B. Day. North Carolina Optometrist. 1947. 11. 2. 1-4.

The author presents a case report wherein plano occupational contact lenses were prescribed to protect the eyes of a college swimmer from the effects of chlorine in the water of a swimming pool. Prior to using the contact lenses the patient's eyes were congested after each swim. The contact lenses served to keep the chlorinated water away from the cornea and a portion of the bulbar conjunctiva and the congestion was in great part reduced.

C. C. K.

CARE AND TREATMENT OF CONTACT LENSES. E. H. Novak. The Optometric Weekly. 1947. 38. 14. 505.

Plastic contact lenses should be washed in water and wiped dry with a clean linen cloth. Care should be taken in cleaning the corneal portion of the lens as in plastic lenses these surfaces may easily become scratched.

Lenses may be sterilized by immersion in a germicidal solution such as ST-37 or metaphen 1:1000. The author claims that with proper care these lenses should give many years of useful service.

A. V. H.

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12. MISCELLANEOUS

SYPHILOPHOBIA. Arthur Sayer. The Columbia Optometrist. 1947. 21. February. 2-3.

Sayer believes it would be well for practicing optometrists to have a Kahn or Wassermann blood test performed once a year as a routine precautionary measure. The author points out that the practicing optometrist occasionally encounters syphilitics among his patients. In his work he will turn up various syphilitic eye manifestations such as interstitial keratitis, gumata of the eyelids, extra-ocular muscle palses, the Argyle-Robertson pupil, optic nerve atrophy, etc. Sayer claims these syphilitic eye manifestations are not contagious and should cause no alarm or fear to the optometrist, and in general the contact with the syphilitic patient required in an ocular refraction will not unduly expose

the optometrist to the patient's syphilis. However, he admits there is always a possibility of infection and suggests caution in these cases. He suggests that following the refraction of known syphilitics the optometrist thoroughly scrub his hands with soap and water and follow this with an application of an antiseptic hand lotion.

C. C. K.

RECOMMENDATIONS FOR CREATING A BOARD OF REGISTRATION FOR OPTICIANS. William L. Benedict. The Optical Journal and Review of Optometry. 1947. 84. 6. 56.

For a complete ophthalmic service Benedict suggests the creation of an opticians' specialty board to examine and qualify opticians. His report reviews the present training of opticians in a two-year course at the Rochester (Minn.) Junior College. Throughout the country, Benedict finds the educational background and training of opticians inadequate for the specialized technical work they are called upon to do.

A. V. H.

THE HISTORY AND DEVELOPMENT OF EYE MASSAGE. Harry E. Pine. The Ocularum. 1947. 15. Spring issue. p. 3-4.

The author presents a review of the early use of massage and mechano-therapy in the treatment of squint and other ocular problems.

T. O. B.

JAN EVANGELIST PURKYNE. C. S. Flick. The Optician. (London). 1946. 112. 2908. 445-446.

The author reviews the life (1787-1869) of the Czechoslovakian ophthalmologist Purkyne (or Purkinje, as his name is usually given in English). As Flick points out, Purkinje became one of the early physiologists and ophthalmologists and his work in these fields did much to advance the scientific thinking of his period.

From an ocular standpoint, Purkinje is famous for (1) designing the first perimeter, (2) his discovery and application of the Purkinje images, later used by Helmholtz to support his theory of accommodation, (3) the discovery of the Purkinje phenomenon, and (4) his work in the early development of the ophthalmoscope. Evidence is now clear, says Flick, that Purkinje was the first person to view the interior of the eye and the fundus, his work in this field preceding that of Helmholtz by a number of years.

On the 150th anniversary of Purkinje's birth, the Czechoslo-

vakian government brought out a special commemorative stamp in his honor.

A. V. H.

LIAISON WITH THE MEDICAL PROFESSION. (Editorial) Optics. (Glasgow, Scotland). February. 1947. 1-3.

The editor reviews the early beginnings of the optical profession in England and Scotland in the 16th and 17th centuries, when Charles I granted a charter to the Spectacle Makers Company and when all glasses were prescribed by the refracting opticians of those days. He points out that it was not until the third quarter of the 19th century that many medical men began to take interest in prescribing these aids to vision and that the differences between the refracting optician and physicians have always been magnified by noisy minorities in both groups. He points out further that optometrists and ophthalmologists are natural allies, each supporting the work of the other, and that recent years have seen a marked reduction in the antagonisms shown by the two groups.

A. V. H.

AN EXCLUSIVE VISUAL TRAINING PRACTICE. J. E. Wright. The Optometric Weekly. 1947. 38. 9. 311.

The author, who is an optometrist, practices orthoptics exclusively. His office is located in the loop district of Detroit. His entire practice is referred to him by optometrists and consists of training strabismic, heterophoric, amblyopic, myopic, reading problem and color deficient patients to use their eyes properly.

In his practice he uses two technical orthoptists as assistants. During the past year more than 7,000 training periods were given these patients.

The author describes his method of handling these referred cases and his manner of reporting progress to the optometrist from which the case was received. All refracting, at the start, during the training periods and at the end of training, is done by the optometrist who referred the case.

C. C. K.

PROFESSIONAL OBLIGATIONS OF AN OPTOMETRIST IN INDUSTRIAL EYE CARE. G. F. Kintner. (Editorial). The Indiana Optometrist. 1947. 19. 4. 11-12.

The author points out that an employee of an industrial plant

who receives visual care at the hands of an industrial optometrist engaged by industry for this purpose, has the same right to the protection given the public by the optometric code of ethics. The fact that industry is part of the eye care program is not important. It in no way relieves the optometrist who works in an industrial eye program of his obligations to those who become his patients through this channel.

The author stresses that the industrial optometrist does not contract himself out of the principles of ethics which normally guide an optometrist in his relations with a patient. Nor does this permit the optometrist to delegate to lay persons those duties for which he has been trained and licensed.

A. V. H.

OPTOMETRICAL ECONOMICS. W. H. Landon. The Canadian Journal of Optometry. January. 1947. 533-542.

The author reviews the economic relationship between the patient and optometrist and between the optometrist and his profession. He points out the need for proper attitude on the part of optometrists towards the public as a whole, to their patients and fellow practitioners. Landon reviews the findings of a recent survey on what characteristics of a professional man are most apt to attract and hold patients. Cleanliness, personality, an air of "system" about the office, office attractiveness and equipment and last, gentleness combined with sympathy were found to be most effective. The article also summarizes some of the more modern theories relating to optometric fees.

A. V. H.

HISTORY AND DEVELOPMENT OF THE DRIVING RESEARCH LABORATORY. A. R. Lauer. The Optometric Weekly. 1947. 38. 12. 423-428.

The author outlines his work in the field of automobile drivers research from 1925 to 1947. Since 1937 he has served as director of the Driving Research Laboratory at Iowa State College, Ames, Iowa. The paper is well illustrated showing many of the studies conducted by the laboratory and has a very fine and valuable bibliography.

A. V. H.

BOOK NOTICES

CATALOGUE OF THE ADOLPH LOMB OPTICAL LIBRARY AT THE UNIVERSITY OF VIRGINIA. Introduction by James P. C. Southall. University of Virginia Bibliographical Series, No. 7, Charlottesville, Virginia. Board covers. 203 pages. 1947.

This catalogue has been received by the editorial office of our Journal and is mentioned here for the benefit of those who are interested in, or who may require references in, the history and development of modern optical science.

As Professor Southall explains in his introduction, the optical library at the University of Virginia represents the personal library of the late Mr. Adolph Lomb and was given by his brother, Mr. Henry C. Lomb, to the University of Virginia. Mr. Adolph Lomb was considerably interested in those branches of optics having to do with the theory, design, and construction of optical instruments. The contents of the library consist of books, monographs, and special articles mainly on the subjects of geometrical and applied optics, physiological, ophthalmological and optometric optics. Professor Southall is of the opinion that ". . . It is doubtful whether there is such a complete library of optics anywhere else in the world today."

The classification of the material comprising the Lomb Collection is based on the Library of Congress Classification supplemented by suggestions from Professor Southall. The book, monographs, and periodicals are not listed under subjects, but under authors' names.

Optometry is to be congratulated and may well feel honored to have listed in the Lomb Optical Library Catalogue several monographs written by optometrists.

ROBERT E. BANNON.

OUTLINE OF OCULAR REFRACTION. James T. Maxwell, M.D. Medical Publishing Company, Omaha, Nebraska. Second Edition. Cloth. 379 pages. 1946.

The first edition of this book, published in 1937, proved to be of interest to optometric and ophthalmological students as well as to experienced practitioners to the extent that the supply became exhausted. This second edition has been brought up to date and much has been added; as, for example, the subject of orthoptics in which the author acknowledges considerable advancement has occurred.

The completeness of the Text may be estimated by a glance at the chapter headings: I. Applied Optics, II. Optical System of the Eye, III. Trial Case and Accessories, IV. Anomalies of the Optical System of the Eye, V. Aids to Greatly Reduced Vision, VI. Retinoscopy, VII. Binocular Vision, VIII. Ocular Muscle Imbalance, IX. Examination of the Patient. Appendix: I. Ophthalmic Lenses, II. Dispensing.

Maxwell's treatment of the subject material is essentially from the practical side with a minimum of theory. He has presented more than one side of several controversial subjects so that the reader may decide eventually from further study and personal experience which method or which interpretation seems the more reasonable. It is to be regretted, however, that but very few references are given throughout the book and there is no bibliography. Many students and practitioners whose interest may be aroused in certain subjects will be handicapped in further quest for knowledge by the lack of references and/or bibliography. It is understandable that this book does not cover thoroughly the entire field of refraction and allied subjects. Nevertheless, students as well as those in practice who wish to brush up on the basic elements of refraction will find Maxwell's book of considerable help.

The style of writing and the explicit terms used make for easy reading. The chapter on the examination of the patient gives many practical helps and hints which one can obtain only from a man who has had considerable experience in caring for patients. The appendix covering ophthalmic lenses and dispensing should be of particular value to the neophite optometrist.

ROBERT E. BANNON.

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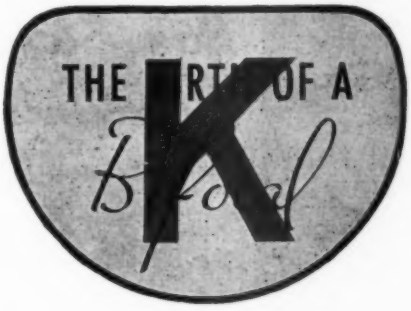

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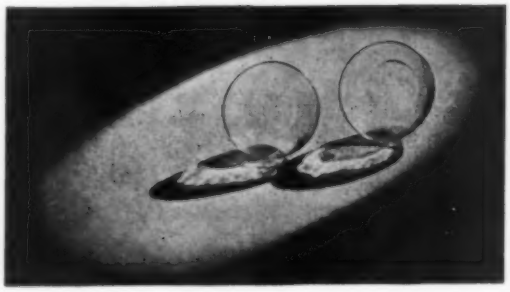

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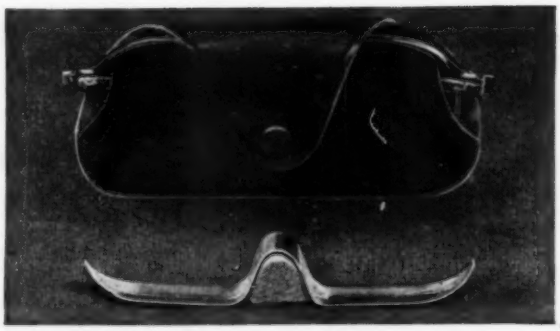

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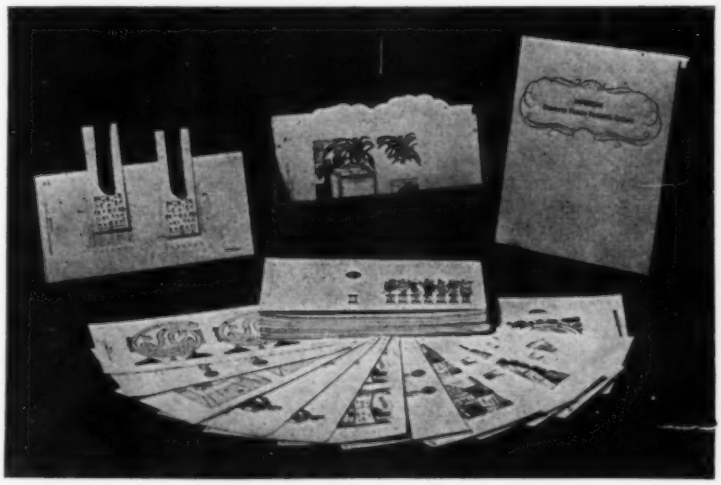

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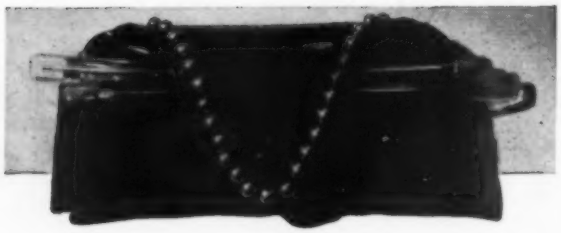

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